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Health Impact Assessment as a Policy Innovation

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ACADEMIC DISSERTATION
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I Nilunger L, Elinder L, Pettersson B. The need for health impact assessment. *Eurohealth, winter issue 2002/2003.*

II Nilunger Mannheimer L, Lehto J, Östlin P. Are the normative expectations followed in the practice of Health Impact Assessment? *Submitted to Health Promotion International March 2009.*

III Nilunger L, Burström B, Östlin P, Diderichsen F. Using risk analysis in Health Impact Assessment: the impact of different relative risks for men and women in different socio-economic groups. *Health Policy. 2004 Feb;67(2):215-24.*

IV Nilunger Mannheimer L, Gulis G, Lehto J, Östlin P. Introducing Health Impact Assessment – an analysis of political and administrative intersectoral working methods. *European Journal of Public Health. 2007 Oct;17(5):526-31.*

V Nilunger Mannheimer L, Lehto J, Östlin P. Window of opportunity for intersectoral health policy in Sweden – open, half-open or half-shut? *Health Promotion International. 2007 Dec;22(4):307-15.*

ABSTRACT

Health Impact Assessment (HIA) has been defined as a combination of tools, methods and procedures to judge and predict health impacts of various policies, programmes or projects. Understanding how policies of different sectors influence public health in general and the health of different groups of the population in particular is therefore crucial to achieve population health improvement. It is important to analyse how HIA that may influence health has been developed and formulated. HIA can be seen as an embryo of a new health policy innovation which is multidimensional and intersectoral. These new dimensions in health policy face challenges in translating a policy idea into practice. This thesis aims at giving an explorative analysis of the development of the HIA. The purpose is to highlight different aspects of transferring some of the ideas of the HIA into practice. The overall objective of the thesis was to study HIA as a a) policy innovation ; b) a set of suggested procedures and methodologies and c) a tool to raise population health higher among the aims of different policies and policy sectors.

Study I aimed to investigate the need to screen for health impacts of policies. The material consisted of Swedish governmental inquiries for 2002-2003. A checklist was developed based on the health determinants that were in the focus for the Swedish public health policy. Every inquiry was analysed to explore whether any relevant health impacts would occur.

The aim of Study II was to analyse the congruity between normative statements of HIA in the Gothenburg consensus paper and practice, by using selected case studies. The material was based on a literature search for scientific articles resulting in a retrieval of 103 studies, among them 31 case studies.

Study III aimed to develop the quantitative methodology for HIA, focusing on the relative risk in assessing impact and attributable fraction for a health determinant and to use the outcome measure of DALYs in different socio-economic groups. Depending on the relative risk used (gathered from scientific articles through literature search) inequality between socio-economic groups could increase or decrease.

The aim of Study IV was to analyse the initiation of an HIA, as a pilot, at the local level in a country in socio-economic and political transition. A core group was trained in HIA and carried out a HIA intersectorally. The core group, consisting of civil servants, politicians and directors, were later interviewed regarding intersectoral working methods. The analysis was based on a qualitative content analytical

framework and adopting the policy analysis framework developed by John Kingdon.

Finally, Study V analysed the implementation of HIA at national and local levels in Sweden. The data were collected by a literature search for both grey literature and scientific articles which then underwent a qualitative content analysis and the results were interpreted using the framework of Kingdon.

In conclusion, it appears that HIA is most successful as an advocacy tool, supported for its normative aim and value. HIA is challenged by its ambitious aim of providing evidence-based policy advice and consequently solving the technical difficulties of fulfilling this aim. In practice, HIA is not easy to extrapolate (methods, material, on what projects/programs/policies etc) from one level or country to another and it seems that it needs to be developed by taking contextual barriers and enablers into consideration.

TIIVISTELMÄ

Terveysvaikutusten arviointi (TVA) on määritelty politiikkojen, ohjelmien ja projektien terveysvaikutusten määrittelyn ja ennustamisen välineiden, menetelmien ja käytäntöjen yhdistelmäksi. Väestön terveyden parantamisen kannalta on ratkaisevan tärkeää ymmärtää, miten eri sektyorien politiikat vaikuttavat kansanterveyteen yleensä ja eri väestöryhmien terveyteen erityisesti. On tärkeää myös analysoida, miten potentiaalisesti terveyteen vaikuttava TVA on kehitetty ja hahmotettu.. TVA voidaan nähdä uuden politiikkainnovaation alkiona, jota luonnehtii moniaineksisuus ja politiikkasektorien välisyys. Tämä moniaineksisuus tuottaa terveyspolitiikalle haasteita, kun ideaa pyritään toteuttamaan käytännössä.

Tämän väitöskirjatutkimuksen tarkoitus on tuottaa eksploratiivinen erittely TVA:n kehityksestä.. Pyrkimyksenä on tehdä näkyväksi TVA:n käytäntöön viemisen keskeisiä aspekteja.. Tutkimuksen yleisenä tavoitteena oli tutkia TVA:ta a) politiikkainnovaationa, b) joukkona ehdotettuja toimintakäytäntöjä ja metodologioita ja c) välineenä, joka voi nostaa väestön terveyden korkeammalla eri politiikkojen ja politiikkasektorien tavoitteiden joukossa.

Osatutkimus I tutki tervaysvaikutusten arviointia tarvitsevien politiikkojen seulontaa politiikkaehdotusten joukosta. Aineistona oli Ruotsin hallituksen esitykset valtiopäiville vuosina 2002-2003. Seulontakysymyslista rakennettiin tuolloisen Ruotsin kansanterveysohjelman nimeämien terveyden determinanttien perusteella. Kaikki esitykset analysoitiin niiden mahdollisten terveysvaikutusten suhteen.

Osatutkimuksen II aiheena oli TVA:ta koskevan Göteborgin konsensuskannanoton sisältämin normatiivisten odotusten toteutuminen terveysvaikutusten arvioinnin käytännössä. Tutkimusaineisto luotiin kirjallisuushaulla, joka tuotti 103 tieteellisissä julkiasuissa ilmestynyttä raporttia, joista 31 olivat raportteja yksittäisistä vaikutusarvioinneista ja muut yleisemmän tason raportteja.

Osatutkimuksessa III kokeiltiin terveysvaikutusten arvointiin sopivaa kvantitatiivista metodologiaa, jossa sovellettiin suhteellisten riskien, eri tekijöiden selitysosuuksien ja toimintakyvyn rajoituksista vapaiden odotettujen elinvuosien (DALY) arvointia suhteessa yhteen keskeiseen terveyden determinanttiin ja eri sosiaaliryhmien terveyteen. Keskeinen havainto oli, että suhteellisen riskin valinta (aiemmissa tieteellisissä julkaisuissa esitetyistä vaihtoehdoista) vaikutti siihen, oliko odotettu seuraamus eri sosiaaliryhmien terveyserojen kasvaminen vai väheneminen.

Osatutkimuksessa IV seurattiin paikallisen tason TVA:n käyntiin saamista pilottiprojektilla syvällisen sosio-ekonomisen ja poliittisen muutosta kokevassa maassa. Yrinryhmä koulutettiin TVA:n toteuttamiseen ja se toteutti sektorirajat ylittävän vaikutusten arviointihankkeen. Ydinryhmä, joka koostui virkamiehistä, poliittisista päättäjistä ja halinnollisista johtajista haastateltiin hankkeen jälkeen. Menetelmänä oli aineiston kvalitatiivinen sisällönanalyysi ja teoreettisena ohjeena John Kingdonin kehittämä politiikka-analyysin malli.

Osatutkimus V eritteli TVA:n toimeenpanoa Ruotsissa kansallisella ja paikallisella tasolla. Aineistona oli kirjallisuushaulla löydetty tieteellinen ja ”harmaa” kirjallisuus. Aineisto analysoitiin kvalitatiivisen sisällönanalyysin menetelmällä ja käyttäen teoreettisena ohjeena Kingdonin politiikka-analyysin mallia.

Keskeinen johtopäätös on, että TVA menestyy parhaiten välineenä kansanterveyden advokaatiossa, jolloin se myös tukeutuu esitettyihin normatiivisiin päämääriin ja arvoihin. TVA:n haasteena on sen kunnianhimoinen tavoite luoda perusta tieteelliseen näyttöön perustuvalle politiikalle, joka edellyttäisi tämän tavoitteen synnyttämän evidensssin tuottamisen teknisen vaatimuksen ratkaisemista. Käytännössä terveysvaikutuksia ei ole helppo ennakoida eikä vaikutuksia koskeva tieto ole yksinkertaisesti siirrettävissä maasta tai hallinnon tasolta toiseen. Näyttää siltä, että TVA:n kehittämisessä on keskeistä ottaa huomioon kontekstuaaliset esteet ja edellytykset.

INTRODUCTION

Health Impact Assessment (HIA) has been defined as a combination of tools, methods and procedures to judge and predict health impacts of various policies, programmes or projects (Nordic School of Public Health, 1999). HIA is fundamentally a bridge between policy/politics and research aiming at an improved evidence-based public health policy-making. During the last decades, an increasing number of countries have set national and regional targets and priorities for improving the health status of their populations. The targets have been formulated in both quantitative and qualitative terms and achieving them requires new tools and procedures (Ritsatakis, 2000). Working towards health targets involves the active participation of many sectors, in addition to the health care sector. Understanding how policies of these sectors influence public health in general and the health of different groups of the population in particular is therefore crucial to achieving the health targets and a general health improvement. It is in this context that HIA as an inter- and multisectoral approach that may influence health has been developed and formulated.

At the beginning of the 1980s, a new movement developed, aiming at shifting the then prevailing individual-oriented medical philosophy of health and health care towards population-oriented public health. The direction of the shift was expected to be from curative to preventive care focusing on social determinants of health and inter- and multisectoral policy approaches. Many factors have influenced this development, from international initiatives such as World Health Organisation's Health for All policy (WHO 1979; 1981; 1998), the public health policy as suggested in the European Union Maastricht and Amsterdam treaties (European Commission, 1992; 1997) to individual studies such as the early and often mentioned Lalonde report (Lalonde, 1974) and Cochrane's (Cochrane, 1971) promotion of a rigorous evaluation of health and health services (Baggott, 2000). Health is shaped by age, gender, ethnicity, socioeconomic status, and factors related to the way people live and work (WHO, 2008). Consequently, policies of sectors, such as environment, education, finance, labour, housing, agriculture, social welfare, justice and security are equally or even more important for shaping people's health.

HIA can be seen as an embryo of a new health policy innovation which is multidimensional and intersectoral (Kemm et al, 2004). This new dimension in health policy faces challenges in translating policy ideas into practice. Along the way, from being an idea about a tool to become fully implemented, the development of

HIA includes several aspects such as

- its history in the context of public health and health policy and promotion,
- its roots in the experience of other forms of impact assessment practices and ideas, such as the Environmental Impact Assessment,
- the origin, theory and definition of the idea,
- the promotion and advocacy in different countries and organisations,
- its impact on decision-making and public policies.

The aim of this thesis is to investigate these various factors with the purpose of providing an explorative analysis of the development of the HIA as a policy innovation. The purpose is to highlight different aspects of transferring the ideas of the HIA into practice (execution). The overall objective of the thesis was to study HIA as a a) policy innovation; b) a suggested set of procedures and methodologies and c) a tool to raise population health higher among the aims and practices of different policies and policy sectors.

The first part of the summary explores the conceptual map for public policy development in general and for analysing health and social policy in particular. The second part is a literature based review of the development of the HIA innovation, followed by a summary of the data, methods and results of the studies published in the original articles. Finally, the summary ends with a discussion and conclusions.

CONCEPTUAL FRAMEWORK

Public policy

There are many different frameworks for understanding public policy. Nevertheless, all deal with the different perspectives, the way policy process is built up, the mechanisms, functions, ideas behind them and actors involved. The frameworks provide conceptual maps and different expectations on how the policy making process works. Traditionally, decision-making has mainly been studied in relation to its administrative issues, political accountability and the efficiency of governmental procedures (John, 1998).

Policy research involves several disciplines. Therefore, a range of methods needs to be used to fully explore the policy process, such as those involved in political science, sociology, economics, history, anthropology and sector-specific policy areas. In this thesis the main focus is on the methodologies used in health policy research. The disciplines and policy areas consider political structure and power, cultural identity, ideas, norms, values, communication, symbols, hierarchy, society, governance but also individual factors such as mentality, spirit and feelings (Arvidsson, 2001; Shore & Wright, 1997). A policy can be seen as a "total social phenomenon" where all economical, legal, cultural (including morality) aspects should be considered (Mauss, 1954). Reinhold points out that policy research may be about trying to find a method for analysing connections between levels and forms of social processes and actions, i.e. "studying through" (Shore & Wright, 1997).

There are many models of policy-making, but usually they are divided into three different ways of describing the decision-making process; the rational choice model, the incrementalist model and the garbage can model.

The *rational decision-making model* focuses on a linear and logical policy-making process. It follows a specific pathway and analyses the way from identifying a problem, facing many different options to deal with the problem and choosing the best (optimal) alternative which is to be implemented. The model usually follows seven steps: problem identification, defining options for actions, assessing the options, deciding on the best alternative, implementation, evaluation and, if necessary, modifying the decision. The model is based on a linear model of public policy. It is a top-down approach, based on earlier attempts to formulate policies (successes or failures) and leads to new attempts to initiate and formulate it. This model has

been criticised for its rigorousness and its inability to explain the real policy process which is not really "linear" in the real world (John, 1998).

The *incrementalist model*, based on Lindblom's theory (Lindblom, 1968) assumes that most political changes do not occur in a formal, linear setting, but with small adjustments and by small steps due to various characteristics of political decision-making. An incrementalist leans towards an open process where there are endless and continuous intersections with different actors and where no decision-maker is more dominant than the other. From an incrementalist viewpoint, radical changes in public policies are unusual and will require occurrence of crisis and/or external interference (John, 1998).

The *garbage can model* was developed by Cohen, March and Olsen (Cohen et al, 1972), derived from a theory based on uncertainty within the decision-making process. The model separates the decision-makers, problems and solutions from each other, which is the total reverse from other theories. The complexity and uncertainty of the decision-making processes are set as a baseline where the factors of participation, solutions, problems and choice opportunities are put in a garbage can and where each factor has a life of its own (Parsons, 1995). The outcome is a mix of "garbage". According to Cohen and his colleagues, "it is a collection of choices looking for problems, issues and feelings looking for decision situations in which they might be aired, solutions looking for issues to which they might be the answer and decision makers looking for work" (Kingdon, 1995).

HIA is mainly presented and advocated as if it was based on a rational model, involving a decision-making process which is developed through a clear step-by-step process (Nordic School of Public Health, 1999). The advantage of explaining HIA as a rational process is that it becomes formal and clear to describe and explore the policy formulation of the policy process and how different options may be selected by decision-makers (John, 1998). The disadvantage may be that it does not represent a fully realistic picture, given that the policy process is both rational and incremental, and sometimes resembles more the garbage can model, at various times in the policy process. There are some inevitable and important difficulties involved with describing policy development as either rationalistic or incremental-rationalistic. The social norms are constantly changing. Actions of human beings and human health involve physical and social changes that are sometimes not possible to take into account. Neither can policy ever become 100% neutral since it is based on political ideas and ideologies. It is difficult to compromise between aims such as equity, utility and autonomy, and therefore it may be complicated to find a single "rational" solution for the decision makers.

Policy analysis

A democratic decision-making process is expected to be built upon accountability, transparency and fairness of the process (Klein, 2000). However, the decision-making process depends heavily on the historical and current cultural and contextual events. Policy analysis is therefore not a research on its own, but it is described as a field of research (Ham & Hill, 1984; Parsons, 1995).

Policy analysis is sometimes divided into analysis of policy and analysis for policy (Parsons, 1995). Analysis of policy is about determination (why, when, for whom) and content (description). Analysis for policy considers advocacy (wish to influence the policy agenda) and information for policy (detailed research/advice of a judgemental nature). While HIA as a policy tool is to a large extent about analysis for policy, studying the development of HIA draws mostly from the analysis of policy perspective.

Walt (Walt, 1994) and Buse (Buse et al, 2005) describe the policy analysis as an investigation of formulation, initiation and implementation of a process, i.e. analysing the political, financial, managerial and technical resources. This model focuses on the content, actors, processes and context of policy making as well as on the phases of agenda setting, policy initiation, policy formulation and policy implementation. Hall (Hall et al, 1975) introduces three criteria: feasibility, legitimacy and support to be an effective means to analyse policy processes. Tarlov (Tarlov, 1999) illustrates the policy process as two processes in one, an administrative technical function and another more political orientated one.

The thesis focuses on formulation and feasibility of HIA as a new aspect of health policy making, and as a policy innovation. Thus, it partly fits with the descriptions of Walt and Buse but also partly with those of Hall and Tarlov.

Health policy

Health policy has been defined as "goals and means, policy environments and instrument, processes and styles of decision-making, implementation and assessment. It deals with institutions, political power and influence, people and professionals, at different levels from local to global" (Leppo, 1997).

The advocates of "the new public health" often write the history of health policy as if "old public health policy" was restricted to developing health services while the "new public health" focuses more on health promotion and the impact of many

other sectors on population health (e.g. Ashton & Seymour, 1988). However, this is not the full story. For instance, issues such as housing and urbanization in general, as well as the health risks of emerging industrial work conditions were in the focus of the early public health sanitation and hygiene movements already in the 19th century (Rosen, 1993; la Borge, 1992). The social environments related to, for example, unemployment and poverty were also understood as health policy issues, in the early 20th century (John, 1998). The difference between intersectoral policies decades ago and today is that sectors have grown to be much more independent and strong. It may therefore be more difficult today to carry out intersectoral policies and to find the necessary collaboration and co-operation that is needed (Tervonen & Lehto, 2004).

The classical pluralistic theories of politics (e.g. Walt, 1994) may be fruitful in analysing health policy. Frameworks to explain the pluralistic intersectoral health policy making may be called synthesis through evolution models (John, 1998) such as the Sabatiers policy advocacy coalition framework (Sabatier, 2007; Sabatier & Jenkins-Smith, 1993) and the Kingdon's stream model (Kingdon, 1995). Sabatier's advocacy framework focuses on advocacy coalitions. It is about actors who share a set of beliefs and how to form coalitions to initiate and formulate policy. These coalitions are dependent on funding, expertise, supporters and legal authority. The framework is based on five assumptions: 1) technical information; 2) the notion of time, 3) the policy subsystem, 4) the variety of actors and the belief system that refers to priorities and 5) perceptions (Gagnon et al, 2007). As a result, Sabatier claims that some policies are more difficult to change than others depending on how strong the beliefs of certain core issues are among political actors (Baggott, 2000).

According to Kingdon, policy changes operate in three "streams" of policy making: at the levels of problem identification, making policy choices and political action and climate (Kingdom, 1995). The three streams operate in a constant "flow" with no clear beginnings or ends. For a change in policy to occur (policy window), a window of opportunity should occur in all three streams simultaneously. However, the streams run relatively independently. The strength of Kingdon's framework is that a policy is analysed in relation to the underlying problems, that is, why a policy appears at a particular moment, how and by whom. This relates to the politics element which stresses the activities of different political actors, both visible and hidden participants. The visible participants could act both within and outside the government and push issues to the political agenda. The hidden participants (experts, academics, consultants, etc) are not as explicit in their attempts at

getting an issue on the political agenda as they propose more alternatives to solve the problem (Walt, 1994). The politics stream also takes political and ideological views into account. The policy stream focuses more on the technical and administrative elements of problem solving by different actors and this is usually carried out by its technical facility (to solve the problem), congruence with existing values, prediction of future constraints (political, financial, technical) and the public's acceptability (Walt, 1994).

The importance of politics is a highlighted area in public policy and its correlation with various sectors. Politics is sometimes referred to and divided into the terms of high and low politics, where high politics is defined as

"the maintenance of core values – including national self-preservation – and the long-term objectives of the state" (Evans & Newnham in Walt 1994)

and low politics as

"not involving fundamental or key questions relating to a state's national interests, or those of important and significant groups within the state" (Evans & Newnham in Walt 1994).

High politics includes issues that are of macro or systematic importance and low politics belongs more to the routine, everyday, sectoral and micro policies (Walt, 1994). Defined in this way, Walt argues that high politics is often run by a small group of experts and politicians, a political elite, compared to the broader, more open term of low politics which allows different groups and actors to participate at various levels in the decision-making process. When it comes to health, public health or health care, these are universally important issues. However, Baggott (Baggott, 2000) argues that health promotion is rarely put on the macro or systematic agenda (high politics). The health promotion arena would be considered to be a low politics area, where many groups and actors may have a higher influence. This differs from the intersectoral health policy approach several decades ago when sectors were not as strong and independent as today (Rosen, 1993; Tervonen & Lehto, 2004).

Policy innovation

Policy change or policy innovation is about how new policies emerge, how certain topics make it to the political agenda and how, who and in what way political and non-political sectors allow new innovations. Rogers (Rogers, 2003) presented the diffusion of innovation theory which is defined as "the process by which an innovation is communicating though certain channels over time among members of a social system" (Nutbeam & Harris, 1999). The process is described as a rational way of communication, from one main information part to an audience who receives the information. There are five components of this process: innovation attributes; advantage, compatibility, complexibility, triability and observarbility.

Evidence-based policy

Evidence-based policy derives from the term of evidence-based medicine. Evidence-based ideology has been defined as "a systematic collected proof on the effects of health related interventions from social and health sciences" (Niessen et al, 2000). There are two ways of looking at the evidence-based approach in decision-making processes (Dobrow et al, 2004): the philosophical/normative approach and the practical/operational approach. The philosophical/normative approach is based on what kinds of sources of evidence would be most ideal to the current situation. The second approach takes into account the context of the situation to determine what evidence really is available. To build on these approaches, it is important to consider the contextual factors and conditions.

There is an ongoing debate about the definition of evidence and how it should be applied (for example Davies et al, 2007; Pawson, 2007). Using the term 'evidence' for both science and policy is not unproblematic. The critics of evidence-based policy argue that a policy is not a rational process and that much of the needed evidence for making policy choices is not available. Some claim that policy is driven by politics, where evidence is just one of many factors that the policy process is built upon (Nutley et al, 2007). Furthermore, different stakeholders/actors represent different interests depending on what approach is chosen (Frith, 1999). It is also suggested that evidence is used to back up ideological reasons and to support arguments and plans (Nutley et al, 2007). The debate continues on what kind of evidence is presented and how it is used. These are understood as issues of applied theories and methods. There are ranking systems in medicine which rank methods

such as random control trials very high and qualitative methods or cross-sectional studies much lower on the evidence based scale (Britton, 2000). In addition, science is not value-free, regardless of what methods have been used. This indicates that evidence-based policy, defined similarly as in biomedicine, may be unrealistic. A more realistic understanding of the evidence-based policy might be to help "people making well-informed decisions about policy, programs and projects by putting the best available evidence from research at the heart of policy development and implementation" (Nutley et al, 2007).

HEALTH IMPACT ASSESSMENT AS A POLICY INNOVATION

The origin of HIA

Roots in earlier public health and health promotion policy activities

The health and well-being of a population depend on many factors within the broader environmental, social, economic and cultural arena. These factors can be influenced by policies of different sectors in the society. Improving the health status of a population and reducing ill health pose challenges to national and local governments in multi-sectoral decision-making. Thus, multi- and intersectoral approaches are increasingly needed, especially in sectors outside health care (WHO, 2008).

HIA aims to assess the effects on health of various proposed policies, programmes and projects and to support policy-makers in improving the decision-making process. Thus, the challenge of HIA is to go through three steps: a) how a proposal affects the determinants of health; b) how the determinants of health affect health outcomes and c) feeding back the results from the HIA to the policy-makers to revise the proposal (Swedish Federation of County Councils and Local Authorities, 1998).

Impact assessments as such are not a new approach. There are descriptions about certain impact assessments already in the 19th century in England and France, e.g. the impact of housing policies on the spreading of communicable diseases (Rosen, 1993; la Borge, 1992). Different kinds of HIAs have been a valuable resource within politics and policy for a long time, for example, within environmental health where correlations between housing, working conditions and health outcomes have been known and been important in policy-making for many decades. From the 1960s the correlation between tobacco smoking and health outcomes such as lung cancer and obstructive lung disorders has had a huge influence within policy and politics. It was soon discovered that it was possible to control some of the determinants by the government (Vallgårda, 2001; 2003) such as prices on cigarettes, availability and age limits (Hyland et al, 2006; Schaap et al, 2008). The same reasoning is also applied to alcohol consumption (Bruun et al, 1975; Edwards et al, 1994). During more recent years, the impact assessment has developed to also include the policy

impacts on the variation in health of different socio-economic groups (Douglas & Scott-Samuel, 2001; Exworthy et al, 2003) and the policy impacts on the health of people only indirectly related to the assessed policies, for example, passive smokers or the persons injured by the violence of substance abusers.

Roots in other impact assessments

A significant part of HIA's roots is in Environmental Impact Assessments (EIA) which appeared as a statutory provision, for the first time, in the U.S. National Environmental Policy Act in 1969. The aim of EIAs is to predict environmental consequences on the natural environment including human health of policy proposals. In Europe, EIA has a statutory basis through EU directives (introduced in 1985 and amended in 1997). Even if HIA is derived from EIA, and is also developing as a part of EIA (Wright et al, 2005), there are significant differences between the two. EIA tends to apply a narrower model of public health, being more closely interacting with biomedical perspectives (Kobusch et al, 1997). The newer versions of HIA often aim at applying both a narrow and broad model, to provide a holistic view (Nordic School of Public Health, 1999). The narrower version of HIA, often called EHIA, tends to focus more on environmental issues in practice even though broader health impacts also are included in the definition (Steinemann, 2000). There is much evidence on correlations between environmental topics and the impacts on health (Martuzzi et al, 2003), housing (Thomson et al, 2003) and development of transport (Dora and Racioppi, 2003; Kjellstrom et al, 2003; Gorman et al, 2003; Fleeman & Scott-Samuel, 2000).

Social Impact Assessment (SIA) is an approach where the social impacts on the society or a population are assessed (Social Impact Assessment, 2003). SIA was developed as a consequence of the weaknesses of most EIAs in considering the impacts of the assessed policies on the social environment. The advantage of SIA is that it often covers significant social determinants of health and, thus, includes a broader view on health than many EIAs (Lehto & Ritsatakis, 2001)

The Strategic Environmental Assessment Protocol (SEA) is set within the framework of the 1991 Espoo Convention on Environmental Impact Assessment in a Transboundary Context (http://www.unece.org/env/eia/). The Protocol demands that health considerations must be taken into account by requiring parties to assess both the environmental and health effects of proposals. The word "strategic" is used to describe the scope of policies that are assessed and the time in the development of those policies when the assessment should be carried out. The focus of SEA is on

large developmental plans or programmes which only later are split into restricted projects or proposals (BMA, 1998). Thus, it also allows more time for environmental and health issues to be considered. The Protocol on SEA especially emphasises the consideration for human health, opening up the possibility for health to be thoroughly considered within environmental assessment. Nevertheless, in both EIA and SEA the main concern is the physical environment and environmental authorities are in charge of the quality of the assessments (BMA, 1998).

Content of the HIA innovation

HIA definitions

HIA is defined by the Gothenburg consensus paper as "*a combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population and the distribution of those effects within the population*" (Nordic School of Public Health, 1999). Even if this definition is a well used reference in many studies, there are many more definitions and descriptions of what HIA is or should be (Table 1). The definitions vary between being used as a "methodology", "framework", "approach", "tool", "procedure estimation" and "process". Consequently, these definitions show the many variations and the broad use of the concept.

Table 1. Definitions of HIA.

Definitions of HIA
HIA is a combination of methods to examine formally the potential health effects of a proposed policy, program or project (Cole et al 2007).
A multidisciplinary process within which a range of evidence about the health effects of a proposal is considered in a structered framework É based on a broad model of health which proposes that economic, political, social, psychological and environmental factors determine population health (Northern and York Public Health Observatory in Great Britain).
The estimation of the effects of a specified action on the health of a defined population (Scott-Samuel 1998).
HIA is a means of evidence based policy making for improvement in health. It is a combination of methods whose aim its to assess the health consequences to a population of a policy, project or program that does not necessarily have health as its primary objective (Lock 2000).
HIA is defined as any combination of procedures or methods by which a proposed policy or program may be judged as to the effects it may have on the health of a population (Frankish et al 1996).
HIA can best be described as a decision-making tool. One that is designed to take account of the wide range of potential effects that a given proposal may have on the health of its target population. (UK NHS 2001)
HIA is a developing approach that can help to identify and consider the potential or actual health impacts of a proposal on a population. Its primary output is a set of evidence-based recommendations geared to informing the decision-making process. (Quigley & Taylor 2003/2004)
HIA provides a structured framework to map the full range of health consequences of any proposal, whether these are negative or positive. It helps clarify the expected health implications of a given action, and of any alternatives being considered, for the population groups affected by the proposal. It allows health to be considered early in the process of policy development and so helps ensure that health impact are not overlooked. (WHO EURO 2002)
A methodology which enables the identification, prediction and evaluation of the likely changes in health risk, both positive and negative (single or collective) of a policy, program plan or development action on a defined population. These changes may be direct and immediate or indirect and delayed. (Morgan 1998)
HIA is a method for describing and estimating the effects that a proposed project or policy may have on the health of a population (British Columbia Ministry of Health 1995).
”A tool to analyse a programs impact on wide range of factors that affect human health” (Winters 2001).

The value and methodology principles of HIA

Much of the literature on HIA acknowledges that HIA cannot be totally value free (Kemm, 2004). The Gothenburg Consensus Paper (Nordic School of Public Health, 1999) on HIA normatively suggests a core set of values:

- Equity; taking into consideration the distribution of the health effects e.g. geographical, socio-economical or other susceptible (vulnerable, marginalised or disadvantaged) groups in society;
- The ethical use of evidence; the use of qualitative and quantitative evidence has to be rigorous and based on different scientific disciplines and methods to achieve a comprehensive assessment;
- Democracy; the right of people to participate in a transparent process of decision-making; and,
- Sustainable development; including consideration for the short and long-term, and direct and indirect effects.

Equity

According to Douglas & Scott-Samuel (Douglas & Scott-Samuel, 2001), HIA should explicitly consider the impacts on inequalities in health, to explore and analyse different consequences for different population groups, and decision-makers should be enabled to judge the trade-offs between the different policy alternatives. From a policy point of view, three different perspectives on equity impacts may be presented: 1) assessing impact on vulnerable/poor groups and not only on the affected population as a whole 2) assessing impact on the health gap between the best and worst off and 3) assessing the impact on the shape of the distribution of health among the whole affected population. Quite often the only feasible perspective for HIA carried out at the local level, in practice, has meant concern about vulnerable population groups (Nilunger Mannheimer, 2009).

Ethical use of evidence

There are three basic types of scientific evidence that may be used in HIA (Nordic School of Public Health, 1999):

- Review of earlier published evidence on the potential impact of the same type of policy, program or project on the health of the affected people;

- Production of a new prediction of the impact of the proposal by quantitative research methods; and
- Production of a new prediction of the impact of the proposal by qualitative research methods.

Whatever model or method is used in an HIA, it should use robust evidence (Joffe, 2003) and there is often a need for a mixture of methods and techniques from different perspectives (Mindell & Joffe, 2003). However, there is often a lack of robustness in the methods used, which is indicated by the fact that the majority of the case studies reviewed had used a rapid appraisal method (Nilunger Mannheimer et al, 2009). Procedures such as key stakeholder meetings and literature reviews that are not carried out systematically may undermine the validity of the assessment. Focusing on the quantitatively "measurable" determinants and risks only may lead to too narrow a scope for the potential impacts of the proposed policy and leave significant impacts out of the analysis (Milner et al, 2003). However, evidence presented in quantitative terms may often be more convincing to decision-makers than the results of a qualitative analysis (Veerman et al, 2005).

The ethics of HIA is often presented together with recommendations for following values such as equity, sustainability and impartiality (Kemm 2007; Australian National Code of HIA Ethics, 1998). A code of ethics is suggested to help ensuring fairness of the process and content of the assessment and convincing stakeholders of HIA processes about quality of the standards and processes used (Australian National Code of HIA Ethics, 1998).

Participation

One often suggested method to advance democracy in the HIA process is to include the representatives of the stakeholders in the dialogue through focus groups, sessions, workshops or an advisory group consisting of representatives of the stakeholders (Albert et al, 1997). Thus stakeholders are not only asked, they are also organized in a kind of supervisory position to overlook the whole HIA process. By participation, stakeholders can be ensured that their voices, thoughts and ideas in the relevant area are considered in the assessment. Participation has become known as "little democracy" (Clark & Claxton, 2006) where people have the right to knowledge about the process and the right to express their opinions and thoughts. Participation can also be seen as a learning experience about the process (Kemm, 2007). Participation involves different stakeholders and it is important that these

represent all relevant groups for the results to be valid. Participation brings about social justice and enables the gathering of knowledge about views, values and experiences from the community members. The results from the views of stakeholders reflecting the particular community, location and time. This means it may be difficult to extrapolate results from one study to another. Also, participation needs to involve discussion and analysis of people not participating in these meetings (Quigley & Taylor, 2004). A broad community participation is thought to result in a more accurate prediction of impacts, improved decision-making, increased transparency and local accountability than a tight or no participation, resolve social conflict and promote social cohesion, making the public aware of the effects on health (learning experience) which may lead to changed attitudes (Parry & Wright, 2003; Ståhl et al, 2006). Community involvement may have a positive effect on project development. However, while HIAs often tend to apply top-down professional-led workshops for participation, the more ambitious participation models are costly and time-consuming (Parry & Wright, 2003; Parry & Kemm, 2005). In addition, it may be unclear who the representatives are as the size of the population and the scale of the policy are too big (Wright et al, 2005). Also, political officials have difficulties in engaging the public to attend HIA meetings and there is mutual disbelief between the public representatives and the public officials (Kearney, 2004). It seems that participation, in the name of HIA, has been used as empowerment, to promote the local ownership of policy. However, even within small projects, participation seems to require much resources, facing methodological/practical difficulties and is therefore vulnerable to bias, and it is often unrepresentative of the whole population (Wright et al, 2005).

Sustainability

The value of sustainability considers the potential health effects in the future as well as in the immediate present. Sustainability often applies to environmental HIA or similar urbanisation projects and has not been a priority focus of HIA studies (Nilunger Mannheimer et al, 2009). As HIA is often carried out by using rapid methods, there is no time or capacity for analysing impacts in the long run. Moreover, there is a need for more use of quantitative methods, rather than qualitative, to be able to calculate the magnitude of complex impacts in the future.

Linking HIA to policy and decision-making processes

Decision-making includes choices and trade-off, in which health is just one policy goal among many others such as economic competitiveness, protection of the environment, education, employment and social wellbeing. Reporting to decision-makers is an important step in the HIA process. It is significant to analyse how the decision-makers were involved and measure their commitment to the HIA process. Also, it is important to evaluate the process in terms of timing, and whether or not the HIA made an impact on the final decision (Quigley & Taylor, 2004). Not many studies have so far contributed to the development of in-depth theoretical frameworks or empirical analyses of this phase of the HIA processes (Bekker, 2007). The HIA contributes to the making of judgments (Lock, 2000) and that is why it also contributes to making value judgements. Also from this perspective, there is no such thing as a 100% objective HIA. It is also said that HIA is not a decision-making tool but rather a decision-making support tool (Kemm, 2007). The technical component of the HIA, the assessment, makes predictions about the consequences that a proposal can have. This assessment is to support the decision-makers to make a decision which brings political value judgements (Kemm, 2007). However, separated into a political and technical component, not even the technical component is free of value judgements – at least with regard to choosing which potential future effects are relevant for being predicted. These judgements could be facilitated if a HIA code of ethics were in place (e.g. Australian National Code of HIA Ethics, 1998). A code of ethics not only highlights the awareness of the judgemental components of the assessment, but also covers how to handle these issues.

Until now, few evaluations of the HIA processes have been published (Quigley & Taylor 2004; Parry & Kemm, 2005). Thus, there is not much evidence on what kind of assessment is most appropriate in the practice of applying HIA in real world policy making processes. Without evaluations, HIA cannot be demonstrated and its credibility may be weakened. Evaluating HIA is a complex process, involving the scrutiny of the causal pathways between policy, health determinants and outcome (Quigley & Taylor, 2004). There seems to be lack of time, funding, competence and support for evaluations. However, the few evaluations that in fact have been carried out have shown the importance of both HIA drivers and barriers. Drivers important for HIA were political support and commitment (both in resources and political statements, policies etc), international support and development and training and capacity building to continuously develop and take HIA forward. Agreement between different politicians and public officials was also an indicator of a sustainable

HIA process. Barriers were mostly represented by a lack of intersectorality resulting from the lack of collaboration and co-operation between sectors, conflict of interest, lack of time and human and financial resources (Finer et al, 2005; Nilunger Mannheimer et al, 2007 a).

Advocacy and promotion of the HIA innovation

HIA benefits

One of the main arguments for carrying out HIA is to support decision-makers to develop more health friendly policies in all sectors since health impacts are not usually included in other sectors or assessment tools and are consequently often overlooked (Table 2 presents the HIA benefits). HIA is also expected to focus on inequality, measuring the health impacts on vulnerable groups, and participation having different representatives from various disciplines and sectors. HIA is said to function horizontally, focus on partnership, and thereby strengthen the capacity-building especially on social determinants of health and sustainability. Moreover, HIA tends to be prospective, use a multi-sectoral approach which gives transparency of the decision-making process. In this light, HIA could also be a promoter for public health to be placed higher on the political agenda.

Table 2. Potential benefits of HIA.

Benefits of HIA	References
Bringing the public's health to the table by adding health information to considerations of specific proposals in other sectors.	Cole et al 2007; Frei and Casabianca 2006;Joffe and Mindell 2005;Gulis 2004; Joffe and Sutcliffe 1997;Kreiger et al 2003; Kemm 2000:Kemm 2001, Lock 2000
HIA provides an explicit method of assessing possible positive and negative health effects with a transparent audit trail for others who may want to question the methods or results or redo the analysis with different assumptions.	Cole et al 2007, Bos 2006;Danneberg et al 2006;Joffe and Mindell 2005;Kreiger et al 2003;Kemm 2001;Kemm 2003;Lock 2000
If carefully performed, it provides a reasonable projection of health effects over time that can be important in public justification of decisions by publicly accountable elected decision-makers.	Cole et al 2006;Joffe and Mindell 2005
It can include measurement of cost-effectiveness, aiming to maximise the positive health impacts at the lowest cost.	Bos 2006;Mindell and Joffe 2003
It can increase decision-makers' … and other stakeholders' general awareness of health effects of actions outside the health sector, such as the EIA.	Cole et al 2007; Bos 2006; Cole et al 2005;Frei and Casabianca 2006;Gulis 2004;Joffe and Mindell 2005;Kreiger et al 2003;Kemm 2000;Kemm 2001;Kemm 2003;Mindell and Boltong 2005;Mindell and Joffe 2003; Sim 2003; Verger et al 2006
HIA can help build working relationships and alliances for health promotion among stakeholders and across sectors.	Cole et al 2007; Bos 2006; Cole et al 2005; Danneberg et al 2006;Gulis 2004;Kreiger et al 2003;Kemm 2001; Langford 2005; Mahoney 2005;Mittelmark 2001; Scott-Samuel 2005;Veerman et al 2006
HIA may lead to transparency and accountability in the policy making process and in governmental action or inaction in addressing issues identified through HIA.	Kreiger et al 2003;Kemm 2000;Kemm 2001;Kemm 2004

There are many different characteristics of HIA such as the specific focus on policy/program/project, health determinants, flexibility, values and working methods. Table 3 demonstrates these HIA characteristics.

Table 3. HIA characteristics.

Characteristics of an HIA	Reference
A focus on specific policy or project proposals	Cole et al 2007; Banken 2003; Danneberg et al 2006; Frei and Casabianca 2006; Gulis 2004; Harris 2005; Joffe and Sutcliffe 1997; Kemm 2000; Kemm 2001; Kemm 2003; Lock 2000; Lerer 1999; Mindell and Boltong 2005; Mindell and Joffe 2003; Mittelmark 2001; Parry and Stevens 2001; Scott-Samuel 1996
A comprehensive consideration of potential health impacts	Cole et al 2007; Cole et al 2005; Danneberg et al 2006; Frei and Casabianca 2006; Harris 2005; Joffe and Mindell 2005; Joffe and Sutcliffe 1997; Kemm 2000; Kemm 2001; Kemm 2003; Lock 2000; Lerer 1999; Mittelmark 2001; Parry and Stevens 2001; Scott-Samuel 1996
A broad population based perspective that incorporates multiple determinants and dimensions of health	Cole et al 2006, Bos 2006; Cole et al 2005; Frei and Casabianca 2006; Joffe and Mindell 2005; Joffe and Sutcliffe 1997; Kreiger et al 2003; Kemm 2000; Kemm 2001; Lock 2000; Lerer 1999; Parry and Stevens 2001; Scott-Samuel 2005
A process that is highly structured by maintains flexibility	Cole et al 2007, Bos 2006; Cole et al 2005; Joffe and Mindell 2005; Kemm 2001; Lock 2000; Parry and Stevens 2001
A multidisciplinary systems-based analytical approach	Cole et al 2005, Bos 2006; Cole et al 2007; Frei and Casabianca 2006; Gulis 2004; Kreiger et al 2003; Lock 2000; Mindell and Boltong 2005; Mahoney 2005; Mittelmark 2001; Parry and Stevens 2001
Bringing health issues into decision-making in other sectors whose actions affect population health.	Cole et al 2007, Bos 2006; Cole et al 2008: Frei and Casabianca 2006; Joffe and Mindell 2005; Kemm 2000; Kemm 2001; Lock 2000; Mahoney 2005; Mindell and Boltong 2005; Mindell and Joffe 2003; Mittelmark 2001; Parry and Stevens 2001; Sim 2003; Veerman et al 2006
Bringing health inequality on the agenda, measuring equity between different population groups.	Frei and Casabianca 2006; Gulis 2004; Harris 2005; Joffe and Mindell 2005; Kreiger et al 2003; Kemm 2001; Lock 2000; Lerer 1999; Mindell and Boltong 2005; Mittelmark 2001; Scott-Samuel 2005;
Sustainable development	Gulis 2004; Kemm 2001

Advocacy and promotion of HIA by intergovernmental organisations

WHO

WHO has vigorously promoted intersectoral policy through its Health for All policy, later updated as "Health21", claiming that HIA is a tool to ensure healthy public policy (WHO 1981; 1998).

There are a number of HIA activities in the different WHO regions. The European WHO region has supported HIA since the end of the 1990s as a tool for policy-makers. WHO, together with the Nordic School of Public Health in Gothenburg produced the Gothenburg Consensus Paper (Nordic School of Public Health, 1999), which has become one of the most used references and normative statements for HIA regarding definition, process and values. WHO has also commissioned a few reviews of some aspects of HIA, such as the position of HIA in environmental health impact assessment and the policy implications of HIA (Ståhl et al 2006). The final report of the WHO Commission on Social Determinants of Health recommended the use of health equity impact assessment of all governmental policies, including finance (WHO, 2008). Health equity impact assessment is a specialised type of HIA, with a closer focus on health inequalities.

The World Bank

The World Bank has supported the use of impact assessment for many years in the form of environmental impact assessment, strategic environmental assessment and poverty and social impact assessment (www.worldbank.int). EIA and SEA consider environmental and health impacts even though the focus is on environmental issues. However, SEA includes assessments of policies and programs, not just projects as in EIAs, which has led to extensive work of including, initiating and analysing the role of decision/policy-making within the SEA which becomes very similar to a HIA (World Bank, 2005). SEA also includes the term of sustainability which in turn gives a holistic view of impact assessment, considering economic, environmental and social impacts of various proposals. Poverty and social impact assessment (PSIA) relates to HIA by studying the distribution of the impacts among the poor and the vulnerable groups. This belongs to the sector of welfare and social development than environmental settings.

European Union

The EU has endorsed the intersectoral health policy approach and HIA in several basic treaties, such as the Maastricht treaty (European Commission, 1992) and the Amsterdam treaty (European Commission, 1997). They give the EU and the Member States the responsibility and mandate to ensure that their actions do not have an adverse impact on health, or create conditions that undermine health promotion.

The Lisbon strategy from 2000 also states that all policies should undertake an integrated assessment approach, that is, to go through environmental, economical and social (health included) impact assessment (European Commission, 2000). These normative recommendations have been followed by attempts to develop appropriate HIA procedures and rules. However, they are still in their early phases of development (Lock & McKee, 2005).

Advocacy, promotion, experimenting and early stages of institutionalising in some countries

In a recent mapping and evaluation process of HIA activities in 16 European countries (www.euro.who.int/observatory), different aspects of HIA were studied leading to a summarising picture of the HIA status in parts of the European Union (Wismar et al, 2007). Although the methodology used in the review was not free from bias towards describing the progress in too positive terms, it is worth mentioning the main conclusions:

- HIA is a recognized practice in most of the countries based on findings of the collection of HIA reports;
- most reports were found to have been produced at the local or regional levels;
- both "independent" HIAs" and HIAs integrated within EIA or SIA were reported;
- institutionalising of HIA, defined as setting up a permanent governance function; funding and financing, resource generation and delivery, was incomplete in all countries. However, in four of the countries England, Finland, Wales and the Netherlands, parts of the institutionalising process were found, including functions such as support units responsible and health intelligence for HIA or resource funding or strong governance for HIA; and
- assessing the effectiveness of HIA (meaning that there were impacts of the HIA report leading to changes in the decision-making process), the country

reports from England and Finland indicated impacts that were identified as changes in the proposed policies.

To illustrate some of the progress and variation in introducing the HIA into practice in a number of countries which are portrayed as being the pioneers of HIA, a number of examples are given below:

In ***Finland***, HIA, here referred to environment consequences (physical determinants), and SIA (social and psychological determinants) are statutory processes of the Environmental Impact Assessment Act, the Land Use and Building Act or the Act on the Assessment of the Impacts of the Authorities' Plans, Programmes and Policies on the Environment (http://info.stakes.fi/iva/EN/application/index.htm). Since 1994, about 200 EIAs (including health effects) have been carried out, approximately a 100 impact assessments in land use planning since 1999 and 20 strategic environmental assessments since 2000 (http://info.stakes.fi/iva/EN/publications/index.htm). Human Impact Assessment (HuIA), including both HIA and SIA, has been developed at STAKES since 1993 and is implemented on a non-statutory basis at the national, regional or local level (Kauppinen & Nelimarkka, 2004; Kauppinen et al, 2006). It is also an issue advocated by the Healthy Cities Network. HIA is a focus in the governmental policy document, Health 2015 Public Health Program. Moreover, the EU Commission together with the Finnish Ministry of Health at Finland's EU presidency period highlighted HIA and produced "Health in all policies" (Nelimarkka et al, 2007) advocating, throughout EU, that all sectors take advanced account of all possible health impacts in their decision-making and in the preparation of policy proposals.

In ***Sweden***, the Swedish Government assigned the National Institute of Public Health to develop the HIA process (http://www.fhi.se/templates/Page____1233.aspx), (Swedish National Institute of Public Health 2001; 2003; 2004; 2005; Nilunger Mannheimer, 2007). HIA has been developed in Sweden since the mid-1990s, primarily at the local levels (county councils). However, HIA was also mentioned and highlighted as a potential tool to ensure policy-making in the national intersectoral public health policy "Health on equal terms" (Ministry of Health and Social Affairs, 2000).

In ***the UK*****,** there is a long tradition of experimenting and developing HIA (for example Scott-Samuel, 1996; 1998; 2007). HIA was highly promoted in the Acheson report (Acheson, 1998) which set off a range of HIA activities in the UK. There is governmental support for HIA, stated in several white papers such as "Saving lives: our healthier nation; Towards a healthier Scotland, Better health-better Wales

and Well into 2000 (for Ireland)" (Ali et al, 2007). Several research institutions are highly involved in HIA capacity building, scientific and empirical studies such as the IMPACT at the University of Liverpool (http://www.ihia.org.uk), and the Birmingham University (http://www.pcpoh.bham.ac.uk/publichealth).

In ***the Netherlands***, extensive screening has been carried out of governmental documents which resulted in a number of HIA reports (den Broeder, 2003; Varela et al, 2001). In most ***German*** states (Bundesländer), the Public Health Service laws require health authorities to participate in planning procedures whenever human health may be affected (Fehr et al, 2004). HIA has recently been introduced in ***the US*** which has formerly focused mainly on EIA and SIA. Recently several research institutions have initiated HIA and started to carry out case examples (Cole et al, 2004; 2005a); 2005b; Cole & Fielding, 2007; Dannenberg et al, 2006; 2008). In ***Canada***, the Canadian Environmental Assessment (EA) Act in 2003 is the main governing piece of legislation to be followed under the federal process. Including health in EA in Canada has been recognized by the provinces and territories under different legislative acts and requirements. In ***Australia,*** the focus has mainly been on strengthening the health issues in environmental impact assessments (Mahoney, 2005). However, HIA has been developed through the years and there is an increasing awareness regarding the value of HIA as a cross-sectoral working method and in assessing, for example, aboriginal health and well-being (Harris, 2005; Wheeler, 2005; Aldrich et al, 2005).

Countries such as the USA, Canada, Australia and New Zealand have been reported to carry out HIA within EIA and/or SEA. The integration of HIA with EIA or SEA seemed to be a great advantage since the environmental assessments are already institutionalised by law and these are also continuously funded and supported technically by training activities (Wright et al, 2005).

AIMS AND OBJECTIVES

The aim of this thesis is to highlight different aspects of transferring the ideas of the HIA into practice (execution). The overall objective of the thesis was to study HIA as a a) policy innovation; b) suggested set of procedures and methodologies and c) tool to raise population health higher among the aims and practices of different policies and policy sectors.

Figure 1 presents one way of conducting the HIA process (Swedish Federation of County Councils and Local Authorities, 1998) and how the different purposes of the articles fit into the exploration of the process. The process starts with a policy/program/project which might have an impact on the health outcome (b) (Study III) via different health determinants (a) (Study I). When the proposal has been assessed, recommendation of the best outcomes should be presented to the decision-makers and the proposal could in optimal cases be changed according to the recommendations (c). The whole process can also be studied (Study II, IV and Study V). The latter studies are marked in two rings explaining two different settings of the whole process: Study II examined the normative versus the practice of the HIA process as such and Study IV and V analyse the HIA formulation and implementation at the local and national levels.

The specific objectives of this thesis are to explore:

1. the range of policies that might be relevant for being assessed from the perspective of their impact on health (Study I)
2. the relationship of the normative expectations of HIA and the published HIA practice (Study II)
3. the opportunities for carrying out quantitative analysis of health risks on the health of different population groups (Study III) and
4. the requirements and barriers of implementing HIA in practice in two different countries and at two levels of public administration (Studies IV and V)

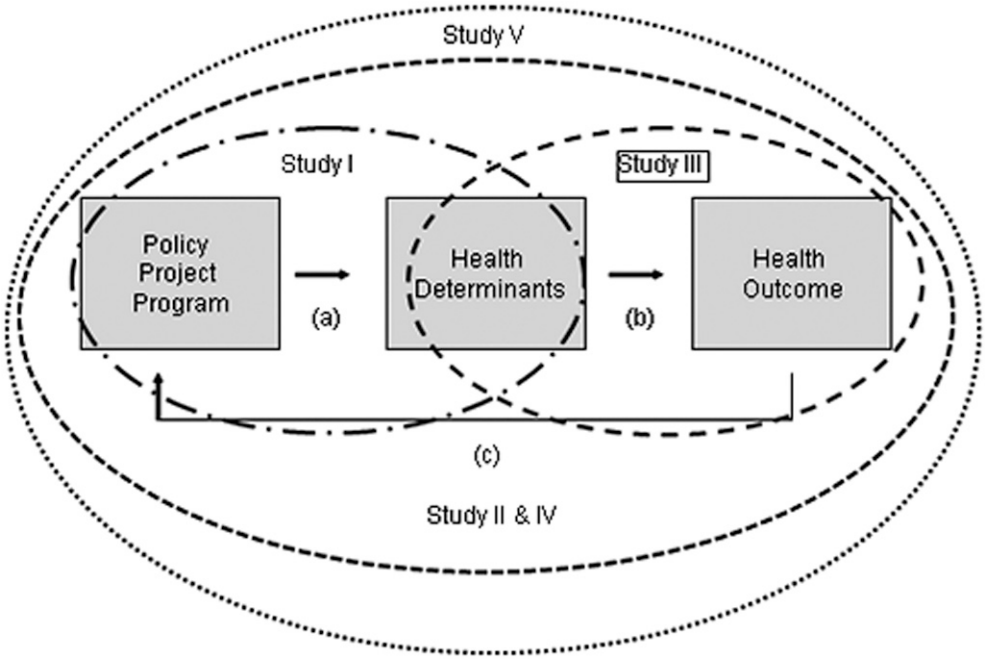

Figure 1. The HIA process according to Federation of County Councils and Local Authorities (1998)

SUMMARY OF THE STUDIES

Study I

The aim of the study was to explore the need for HIA at the various governmental departments at the national level and to what extent a screening of political proposals could identify the ones that would have to undertake a HIA. The material was based on governmental inquiries from all Swedish governmental departments from January 2001 to August 2002 which were published on the governmental website. These inquiries were selected because they were still in an early phase in the decision-making process and there should be time to assess a HIA before the policy-makers made their final decision. A checklist was developed based on the ten (at that point in time) health targets and vulnerable groups (see Study I/appendix I) to analyse the factual content of the policy proposals. The determinants under study were related to proposed national health targets which had been developed for several years by a parliamentarian committee including representatives from political parties, experts, civil servants, academic and civil society organisations and institutions. The selected vulnerable groups, however, were chosen to represent the minority groups in Sweden and were selected by the researcher and her supervisor. The design of the project was to study each inquiry and its potential impact on the health targets and vulnerable groups, and if the content of the inquiry was predicted to have an impact on the population's (or any vulnerable group's) health (by the health targets/determinants), the conclusion was that a HIA should be employed. Two public health experts carried out the screening process by reading through all the inquiries and making a judgement whether or not this might impact any population group or a determinant. The questions raised would naturally be if the judgements made were valid and reliable. In this case, the background and experience of the researchers are important factors. Both the junior and senior researcher were trained in public health (both at a master's level and the senior holds a PhD) as well as studies in political science, economics, biology and nursing.

The results indicated that 33% of all inquiries have a relevant impact on at least one significant health determinant which should lead to a HIA. From these 33%, most inquiries came from the Ministries of Industry, Employment and Communication; Environment; Finance and Agriculture. Using a checklist was a good tool but there was a need for more detailed sub-targets. The currents targets were too

broad and almost everything could have an impact on targets such as "participation in and influence on the society". The process itself, to study the inquiry and to decide whether or not this could affect the health of the population by using the health targets, was not a simple task. It could be better to form a core group, with members with different backgrounds and different interests, in order to get a better decision on whether to carry out a HIA. This is also a way to include stakeholders from other departments, not just those from health or public health, and to highlight the importance of the HIA tool to ensure intersectoral health policy.

Study II

The aim of this study was to review the empirical and theoretical evidence for HIA. The design was to use the Gothenburg Consensus Paper on HIA as a normative standard for assessing the practice of HIA as presented in the published reviews and empirical case studies. When focusing on an evolving area, where there are few established publication forums, a dominance of "grey literature", a constant development of definitions of concepts used and theoretical and empirical approaches applied, a literature analysis cannot use standard review methodologies or easily defined inclusion and exclusion criteria. However, for the exploratory purposes, the applied strategies may be considered appropriate. The search for the data was carried out in November 2008 using the database PubMed. To find the HIA articles, inclusion criteria were set to "health impact assessment, health policy, health determinants, environmental health impact assessment, and intersectoral action for health". Only articles published in English were included. The search term "HIA" resulted in a retrieval of 103 articles of which 31 case studies and 11 reviews were used in the study. The content analysis of the reports was done by one researcher, who had a good experience in the field and her analysis was scrutinised by the two senior members of the research group.

HIA comes across as a strong tool of health advocacy claiming that the HIA ought to be carried out because a) there is legal mandate for it, b) HIA may contribute to better public health and c) it may improve the legitimacy of the policy process. The case studies applied mainly qualitative measures with a strong focus on vulnerable population groups. There were no quantitative studies, only quantifying studies, presenting no new data, only analysis of already existing data, making the evidence fairly uncertain. The lack of quantitative methods left few possibilities to analyse long-term effects such as sustainability or equity from a health gap or

gradient point of view. There was a strong emphasis on participatory aspect in the HIA case studies, indicating a stronger focus on the participation of representatives of health and other policy sectors than on the affected population.

Study III

The aim of the study was to explore the role of evidence in the HIA process and to contribute to the emerging field of quantification of the HIA, by analyzing how different relative risks affect the burden of disease for various socio-economic groups. A further aim was to analyse how different relative risks, incidence rates for smokers compared to non-smokers for men and women in the highest and lowest socioeconomic groups, affect the burden of disease. The study used the method of attributable and impact fraction to estimate the effect of a determinant, measured in DALYs ("common currency" for both mortality and morbidity). Relative risks were estimated by summarizing the evidence found by a literature search on Medline. Smoking prevalence data were obtained by the Swedish Annual Survey of Living Conditions and the calculations of DALYs were gathered from the Swedish burden of disease study.

This study presented one way of modelling, which involved quantification of HIA. An interesting specific result of the study indicated that the inequality could both decrease and increase when the smoking prevalence was put to zero between the lowest and highest socio-economic group. The use of quantification in a HIA is important since many countries and local authorities are setting quantitative health targets which require quantification of the outcome. Quantification regarding the relationship between a determinant and disease outcome is not an easy task, and moreover, it is becoming more complex when one should model it for different socio-economic groups. The study applied the outcome measure DALY which includes challenges such as values in choosing discounting rates and age weights, but it was considered to be a useful measure for the total burden of disease.

Study IV

This study examined a pilot HIA project initiated at the local government level in a country in transition from socialism towards democracy. The aim was to explore facilitators of and barriers to HIA, as experienced by the involved participants, civil

servants, directors and politicians. The process was started by the creation of an intersectoral HIA group involving actors from different sectors of the local government and the institute of public health. The HIA group was responsible for the work and they were later interviewed about their experience of working intersectorally with HIA. The interviews were analysed applying a theory driven qualitative content analysis methodology. The first phase of the analysis focused on categories: communication and co-operation, understanding of HIA, ability and capability of performing HIAs, political support and commitment, and funding and formulation of policy. The second phase of the analysis applied the framework of Kingdon (Kingdon, 1995), to explore the problem behind the initiation of the HIA policy, the politics in HIA development and the initial policy alternatives applied, and the interaction between these three streams of policy development.

The results indicated that a number of factors both acted as facilitators and barriers to the HIA process: a) the lack of intersectorality, the deterioration of health status of the population, and the belief of capacity for a policy change called for the policy-makers to take action; b) the transition period meant that the traditional patterns of policy-making had lost their legitimacy; c) the Slovak Republic was looking for new policy patterns and since HIA was established as a western policy practice in the EU and WHO, Slovak policy-makers were in favour of HIA and d) the local government and the university had developed particular links to the WHO. Introducing HIA was part of this collaboration with the WHO and the EU. But the window of opportunity may close because of a) there are not enough resources in the form of training or capacity and b) HIA may be inhibited by political forces if HIA is to be applied to sensitive political and economical matters.

Study V

The aim of this study was to analyse the agenda setting, formulation, initiation and implementation of the intersectoral public health policy and the tool of Health in All Policies (HiAP), HIA, at the national and local level (exemplified by Stockholm County) in Sweden. A literature search was carried out using scientific and grey literature on intersectoral health policy and HIA in Sweden. A theory driven qualitative content analysis method was applied for analysing the data. The theoretical framework of Kingdon (Kingdon, 1995) was applied where the results were discussed through problem identification (why a window of opportunity opens for an intersectoral health policy and HIA), the factors and impact of politics (support

for the formulation and implementation of policy) and policy (ideas and how best to solve the problem).

The main findings of this study indicated that a) the Swedish development was highly influenced by the international progress and promotion of intersectoral health policy and HIA; b) the process of policy change was more expert based at the national level and more politician based at the local level; and c) there were more activities regarding HIA from the mid-1990s up to the end of the preparation of a national intersectoral health policy (finalised in 2002). In Sweden, public health is perceived as an important issue in principle, but it rarely reaches the highest national policy level in practice. However, if the Health in All Policies (HiAP) was implemented properly, it might place intersectoral health policy higher on the political agenda. To realise HiAP requires support and engagement from many or even all relevant sectors, not just from the health sector. The formulated targets (*why*), at both national and local levels, were limited in regard to suggestions for action and plans for implementation (*how*). The policy did not manage to open the way to involve actors in other policy sectors and was not clear about their responsibility in relation to the new policy. HIA was considered as a long-term process, where steps have already been taken, i.e. creation of ministerial intersectoral health working groups both at the international and national level, leaving the policy window, all in all, half-open.

DISCUSSION AND CONCLUSIONS

Validity and reliability of the studies

Four of the five articles have applied qualitative research approaches (study I, II, IV, V) and one article a quantitative approach (study III).

Study I was an experimental study whose validity is based on the developed checklist and reliability on how the judgements were made. The criteria, the health determinants and vulnerable groups, were chosen as the best available at that point in time. It could be questioned, however, whether the determinants were too broad so that an impact could always be found. One way to come about this weakness was the creation of a HIA core group of researchers/experts from different backgrounds. Unfortunately, due to the lack of time, human resources and support, very few inquiries were discussed. More emphasis on the core group would be of great value. The research approach should also be discussed. Since the study intended to replicate the HIA work in the Netherlands (Varela Put et al, 2001) where policy proposals had been screened for a long time, it could be questioned why the results of the Dutch work were not considered to a greater extent. The Dutch study encountered problems with the screening all policies and it seemed, in fact, impossible to achieve such an ambitious aim. It would perhaps have been more effective to use fewer inquiries, to strengthen the core group, to seek support and to gain commitment and involvement of politicians.

Study II and V were based on a theory driven qualitative content analysis method. In study II the categorization criteria for the content analysis was based on the Gothenburg Consensus Paper. This paper is often referred to in publications as one of the main HIA documents defining the HIA approach and process. The study only included scientific published articles. As mentioned, HIA reports are often published as “grey” literature but it was regarded as too difficult to include this literature because of language problems and availability on the internet. The published scientific papers should be seen as only representing and reflecting part of the HIA development. Therefore the results may be different if grey literature could be included, in which case also the credibility could be improved. In study V both published scientific and grey literature were included. Here one could observe that there were more publications of HIA within the grey literature area, especially at the local level.

The analysis was done by one principal researcher but also supervised by two senior researchers, all having experience in public health. The policy analysis framework of Kingdon was selected for the studies. This was to highlight the separate but interconnected importance of policy, problems and politics as Kingdon (Kingdon, 1995) explicitly suggests. The framework influenced the results of the explorations, but for an exploratory effort, it was proved to be both robust and sensitive enough to help in finding relevant facilitating factors and barriers to carrying out HIA.

Study III used an experimental quantitative method, applying attributable and impact fraction with the outcome measure in DALYs. This was a modelling of what it could be like if these quantitative measures were used in a HIA. The register of the ULF study (Annual Level of Living Survey) was used for data about smoking habits in Sweden. This register is regarded as one of the most reliable data resources of living conditions in Sweden. The established methods such as attributable and impact fraction were later used as the analytical basis. However, the estimates found for the correlation between the determinants (smoking) and outcome (diseases) for different socio-economic groups were not carried out on Swedish data. It could be discussed whether or not it is possible to extrapolate its results to the population of Stockholm/Sweden. The studies also varied in how they measured socio-economic status. Also, to use a measure such as DALY raises some difficulties due to its shortcomings in terms of calculations of burden of disease such as the value of different diseases, age-weighting, discounting, etc. However, the calculation of DALYs was chosen because of its ability to make comparisons between countries or areas and could serve as a good indicator for the size of a health impact.

Study IV was based on interviews with key stakeholders initiating the HIA at the local level in Slovakia. The stakeholders were interviewed using semi-structured methodology and the interviews were taped and transcribed. In order to assess individual statements, stakeholders were asked to complete a questionnaire. The interviews were made with different groups; politicians, civil servants and directors which opened up for different perspectives of the HIA process in the analysis (triangulation). The questions were semi-structured within the group of interviewees. No single one-to-one interview was done due to lack of time and resources. The questions were initiated and designed by the principal researcher and the Slovakian researchers (both junior and senior). The senior researcher was also the one translating between Slovakian to English. However, he was not a trained translator, and this might have biased the results. The Slovakian researcher could also, for the analysis, explaina and describe the Slovakian context regarding culture and mentality which was an important contextual factor.

Conducting interviews and extrapolating the results (via experiences) is difficult since it depends on for example the political and cultural context. However, the experiences in the study are similar to other HIA studies performed in another country in transition (Lock et al 2003).

The HIA as a policy innovation: the spread of HIA has been successful

The aim and definition of HIA have been perceived as rather ambitious (Kemm, 2000; 2001; 2003). Paper II indicated that although there are many different approaches to a HIA definition and aim, their focus in general is pointing at the same direction: by improving the quality of decision-making concerning health, HIA has the potential to contribute to the improvement of the health status of an affected population. This should be done by using a range of methods based on the best available evidence, in a democratic/participatory way, presenting the results for different population groups. This aim has been appealing to actors within both research and politics. Among others, Scott-Samuel (1996); Lock (2000), Douglas & Scott-Samuel (2001) and Parry & Scully (2003), have argued that there is an understanding and support for the impact of health in diverse policy areas and it is essential to not overlook these impacts, especially for vulnerable population groups. Five innovation attributions (Rogers, 2003) could be applied to the development of HIA:

- The aim of HIA served as an *advantage* for researchers and policy-makers as human health was considered more on the political arena and in different policy areas. Human health was highlighted as a topic that should have, at least, equal support and commitment as the environmental impacts.
- HIA was *compatible* to the actors with its broad and ambitious aim and its rational process involving both research and policy-making. HIA was moreover well-matched, presenting the four essential values: democracy, equity, sustainability and right use of methods, to its audience by embracing participation principles and focus on inequalities in health.
- HIA has not been perceived as a *complex* tool. The tool included an almost linear way of working-stages, and was used more as a normative standard for explanation purposes. However, complexity was increased once the tool was to be applied and sustained in practice.
- HIA was rather *triable,* meaning that it was easy to develop and explore, at least in the early stages. The relatively new idea of HIA was and is developed

and experimented in many ways. This makes it more attractive for others, non-users, to adopt HIA.

- HIA was and is *observable* as the idea behind it and its development can be found relatively easily in published journals and in grey literature. Moreover, it has been discussed in open forums and experimented and studied at research institutions and universities. The aim and methods of HIA have been widely debated, which has even more increased its visibility.

HIA have been successful in all five attributes for policy diffusion, as demanded for a successful policy innovation (Rogers, 2003). The first two attributes, advantage and compatibility, are the most important for a high adoption of policy tools and HIA appears to have strongly focused on these two. However, HIA is, in many places, still looked upon as an embryo of a policy idea. It has been successful in its spread of the idea but the implementation of HIA and its action plans are lagging behind. There is an on-going, mainly technical, discussion regarding its normative aim and definition. The advantage of this discussion may be that the spread of HIA becomes even greater. The disadvantage however may be that there is still a lack of support, both technical and political, for HIA as indicated by the results in Studies IV and V.

HIA as a "technical tool": the requirement of HIA values in relation to evidence-based policy

The broad aim of intersectoral health policy and HIA require different kinds of methods and disciplines in the process. This is easy to say, but relatively difficult to apply. As HIA is not just a "technical" tool but also a political tool, it is not always easy to have time or funding to carry out an extensive HIA. The technical use of a HIA is also challenged by the very essence of HIA: prediction of future health impacts. The prediction of impacts – broadly and reliably enough – is an essential demand for a tool which aims at being the means for evidence based policy.

It is becoming increasingly important to discuss "the effectiveness of HIA" or "what works" (Ståhl et al, 2006) – this in combination with techniques that are not always appropriately applied, HIA could be seen as vague in its technical/research approach. It may not be possible to form evidence-based policy as evidence-based medicine, where analyses could be ranked in a hierarchical order of best method or golden standard. Maybe we should replace the ambition of evidenced-based policy

with that of policy-making better informed and advised by best realistically available evidence, knowledge and understanding.

The technical side of HIA is built up on the methods used, both qualitative and quantitative, and the use of its underpinning values, participation/democracy and equity. The case studies in Study II indicated that HIAs are usually carried out using qualitative methods, focus groups or interviews to fulfil the participation criteria. The reason may be that HIA is mainly developed and performed at the local level, where financial and human resources and perhaps also adequate competence are available to a lesser degree. In research institutions, quantitative HIAs dominate (Joffe & Mindell, 2006; Mooy & Gunning-Schepers, 2001), probably due to more available time for modelling, availability of register data on a population level, more experience in thorough literature search, and technical competence in analysing health inequalities both in terms of health gaps and gradients (Study I and III). However, this is not to say that the results of such studies are more legitimate. In fact, Study III showed that the results depend on what level of relative risk is chosen which, in turn, may result in a decrease or increase of health inequalities. Technical analyses of HIA could also quite often present conflicting results. It is however important to use both qualitative and quantitative measures in HIAs. Quantification aims mainly to estimate the magnitude of a health impact. The qualitative studies are usually aiming at providing a descriptive view. From the point of view of democracy, one may criticize some case studies for utilizing focus groups or interviewees, which may not be representative enough of the population and this may be seen as a barrier for the legitimacy of HIA. At the same time, the realities of politics usually lead to a minimum of time to carry out a HIA which consequently often include more rapid methods such as focus group meetings and literature searches (Milner et al, 2003; Joffe, 2003). The technical side of policy is diverse, and it does not always fit into the rather narrow frames of the definition and aim of evidence-based policy (Mindell & Joffe, 2003; Joffe and Mindell, 2002).

These difficulties could be the reason why many countries are focusing on and working with health impacts within EIA, which is already aiming for both the environmental and health impacts and is institutionalised in many countries. The criticism for including the health impacts into EIAs is that the traditions and the institutional context of EIAs are relatively weak regarding analysing the social environment and that there is usually not enough time, financial and human resources for both assessing environmental and social determinants of health consequences, and health aspects are therefore often ignored (Steinemann, 2000).

HIA as a "political tool": the politics is the main driver for HIA

HIA is broadly supported by politicians for its fundamental idea and principles. At the same time, it is technically challenging due to the demand for comprehensiveness, sound evidence base and application of different methods and data. Studies IV and V were focused on the implementation of HIA, where the ideas and methods should be transformed into practice, despite difficulties or obstacles.

As study IV indicated, HIA may be sensitive to economic and social political pressures. In this case, when the city wanted a HIA to be carried out, but the approach was rejected at the national level, interests such as employment opportunities were regarded more important than health. Even when HIA is taking place at the local level and is facilitated by the fewer or lower boundaries between societal sectors, it could face pressures from other actors in the region or from the national level. Political interests and values are therefore of great concern when HIA is to be carried out on sensitive topics (Scott-Samuel & O'Keefe, 2007).

The discussion regarding high and low politics is also therefore relevant. Even if health care is a universal issue of high political interest, it rarely gets the same position as foreign policy, national and public economy or employment initiatives. Public health or health promotion is usually positioned into the margins in health policy, as low politics. Also, using HIA may be contradictive to the political priorities of the EU, national or local main stream politicians, for instance regarding health interests related to food, alcohol, or tobacco issues. This creates the continuous need for public health advocates, both those with expert knowledge and those with lobbying skills, to highlight the issues from the perspective of health and carrying out HIAs to influence the policy-makers and the public.

HIA requires collaboration between different actors such as politicians, researchers and civil servants in various societal sectors. The collaboration needs support to function and commitment to become long-lasting. The will of the actors is important concerning the adoption of a policy. Intersectoral work also requires working methods for horizontal and not only hierarchical cooperation. Not only public organizations but also the disciplines of expertise are most often sectorised vertically and also horizontally, which makes it more difficult to find or to build up intersectoral working ways. The results from this thesis indicate that actors may work well intersectorally when it comes to formulating intersectoral policies. However, the collaboration and co-operation are more difficult when it comes to implementation of policy.

There are a range of institutional frameworks for implementing HIA. They range, for instance, from legal obligation to voluntariness, from receiving statutory funding to being funded only on ad hoc basis, from being the responsibility of particular civil servants with specific training to being carried out by public health generalists or administrators, etc. There are barriers and enablers within all alternatives. In most countries, the present institutional frameworks are somewhere in between the extremes. If HIA has a loose institutional basis there is more space for experimenting with HIA and letting different stakeholders decide whether and how to carry out HIA. A stronger institutional basis would standardise HIA and make it a routine activity, but at the same time standardisation and routines may reduce the impact of HIA on the assessed policy, in a similar manner as has been observed with statutory EIA (Lehto & Ritsatakis, 2001).

HIA has through the years of development become an advocacy tool for highlighting the importance of health and health inequalities between different population groups as affected by the policies of other than the health sector. Its aim and value are supported and shared, in principle, by many policy-makers. If the problems both in the institutional aspects and in the "technical" practices of producing reliable and legitimate assessments can be solved, it can become a significant political tool for elevating public health from low to at least higher politics.

FUTURE RESEARCH

The conclusions of this thesis may lead to new and interesting HIA research topics:

- There seems to be support for HIA in many countries, and as a result it has been rather easy to formulate policies for HIA, however the implementation of the policy has not been straightforward. There is a need for studying the following research questions:

    - Is the rather normative standard for HIA, as presented in the Gothenburg consensus paper, the way forward for HIA or should it be adjusted?
    - Would it be possible to further explore the implementation of recommended HIA values, particularly the participatory and sustainability aspects of HIA in practice?
    - What kinds of working methods and institutional frameworks contribute to best practices in working across sectors in an efficient way?

HIA seems to be caught between the worlds of assessment techniques and balancing between health and other policy aims and interests. As HIA also is a promoter to bring these two worlds closer together and a broker to build a bridge in between them, how might HIA best succeed in its role as promoter and broker?

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ORIGINAL PUBLICATIONS

Health Impact Assessment: screening of Swedish governmental inquiries

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Health Impact Assessment (HIA) is a method for predicting the potential health consequences of political decisions. The main purpose of HIA is two-fold: to increase awareness of what determines health for sectors outside the health sector and also to provide policy-makers with a more efficient way to make informed decisions. Many countries are already looking at the potential health consequences before making decisions, but HIA provides a systematic approach to predict and estimate the potential impact. This approach usually involves developing a tool and checklist, to screen and analyse potential health impacts in an organised fashion.

The aim of this study is to present current developments of HIA at a national level in Sweden and to introduce preliminary results from a screening process of governmental inquiries (directions to green papers) for all ministries during 2001 and 2002. Screening these inquiries provides a good opportunity to access the decision making process at an early stage long before any proposals and white papers are produced. A full report from this process will be published during 2003.

Many organisations and countries have emphasised the need to develop and use HIA. In the international arena, organisations like the EU and WHO have explicitly promoted HIA as a method of estimating the potential health impacts of different policies[1,2] and many countries are in the process of implementing HIA at the national and regional level. From 2003 impact assessments are gradually being introduced to policy areas covered by the EU's competence, among them the area of public health. A variety of implementation methodologies have been developed such as Environmental Impact Assessment (EIA), Strategic Impact Assessment (SIA), Human Impact Assessment and the Integrated Impact Assessment (IIA). Several countries have combined HIA with EIA, mainly because EIA is a well-known concept with established methodology for predicting the environmental impact of different policies.

HIA as a method and process

Generally, HIA methodology can be divided into two parts; first considering how a document (policy, project, program etc) will impact on the determinants of health and second how these determinants, in turn, will affect population health. To conduct a HIA, it is thus necessary to possess knowledge on health determinants and their relationship with health outcomes, as well as data on the distribution of the determinants in the population. Ideally, the results of the HIA should therefore be stimated for the whole population as well as by gender or vulnerable groups.

Conducting a HIA entails four distinctive steps: screening, scoping, appraisal and evaluation. The first step is concerned with document selection and the screening process. A checklist has to be developed based on certain criteria considering possible changes in health outcomes as a consequence of a proposed policy. These criteria are often based on health determinants and take different population group characteristics into consideration. Scoping deals with issues such as when in the policy process HIA should be conducted, by whom and how this should be performed. The appraisal phase constitutes the actual assessment, which can be performed at different levels of depth (a rapid assessment or more in-depth analysis), and the evaluation process should appraise the process itself, i.e. how well the assessment worked and if it has led to any changes in policy or the policy proposal.

HIA in Sweden

In Sweden, a systematic HIA approach at the local and regional level has been developed and occasionally implemented. The Swedish Federation of County Councils and the Association of Local Authorities

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started to develop a tool for HIA in the mid 1990s. The tool is divided into three parts; "the health question", "the health matrix" and "the health impact analysis."[3] Half of all county councils and one sixth of local authorities are using or are in the process of introducing HIA, and a recent evaluation of this HIA approach found that both civil servants and politicians were pleased with the way the process was working..[4]

The first HIA at a national level was conducted in 1995 when Sweden joined the European Union. The HIA assessed potential public health impacts in Sweden of the introduction of EU regulations concerning trade in alcoholic beverages.[5] A second major HIA concerned the health impacts of the EU Common Agriculture Policy.[6] Since then several HIAs have been performed at the national level, e.g. the effects of an age limit on the sale of tobacco. However, these HIAs were not performed in a systematic way, and the outcomes were not always expressed in quantitative terms.

Table 1
THE CHECKLIST FOR THE SCREENING STAGE

1. Description of the policy

2. Does the policy affect any of the ten health targets?
- Participation in influence on the society
- Economic and social security
- Safe and favourable growing up conditions
- Healthy working life
- Sound and safe environments and products
- Health promoting medical care
- Physical activity
- Eating habits and safe food
- Tobacco, alcohol, illicit drugs, doping and gambling
- Prevention of infectious diseases

3. Does the policy affect the population as a whole or some population groups?

	men	women
• The whole population		
• Children		
• Adults		
• Elderly		
• Chronically ill		
• People with a handicap/impairment, also allergy		
• People with an addiction, alcohol, drugs etc		
• Unemployed		
• Immigrants		
• Refugees		
• Single-parents		
• People with low income		
• Homeless people		
• Homosexuals		

Other groups:

Motivation:

4. Will the policy lead to an HIA?
Yes
No
Motivation:

An initial investigation in 2001 to study the implications of using HIA at this level[7] led to the conclusion that the HIA implementation process requires more evaluation in practice.

The screening process

The first step towards implementation of HIA as an integrated part of policy making has recently been taken in Sweden. This obligation is further emphasised in the recent white paper on public health,[8] presented to Parliament in December 2002, and currently passing through the legislative process. The aim of the present study at the National Institute of Public Health (NIPH) is to develop the screening element of the HIA process; to create a checklist followed by screening of governmental inquiries (from January 2001–August 2002) in the ten principle Ministries (finance; defence; health and social affairs; foreign affairs; environment; communication, industry and employment; education; justice; culture and agriculture). The reason for choosing governmental inquiries was to try to enter the decision making process at an early stage. Preferably, HIA should be conducted during the process of proposal development in order to have a fair chance of impacting on the policy maker and policy development. The criteria for governmental inquiries are publicly available at www.regeringen.se and are thus appropriate for systematic screening.

The principle aspects of screening were first to determine the main criteria (based on determinants of health and differential characteristics of population groups) to efficiently screen potential health consequences. Second, to decide how best to use the criteria regarding equity and gender issues.

It was important to look at the determinants of health and health outcomes, as well as how different population groups could be affected by a change in the proposed policy. The proposed national public health goals are based on the major health determinants and were identified by a parliamentarian committee (1997–2000) (Table 1). To estimate the potential health impacts on the population, screening examined the whole population as well as looking at gender and vulnerable groups (Table 1).

Preliminary results

Preliminary results of the present study indicate that approximately one third of all governmental investigations ought to include a HIA. This is based on the

assumption that if one or more health determinants were affected by an inquiry then HIA should be conducted. Most governmental inquiries were undertaken in the Ministry of Industry, Employment and Communication, Agriculture, Environment, and Finance. However, resource constraints mean that it will not always be possible to conduct a HIA, and therefore it will be necessary to prioritise inquiries. At a later stage of the HIA, it will be useful to use the additional criteria disregarded earlier in the checklist such as "type of policy?" "are the effects of the policy direct or indirect?" and "are there short or long run health consequences?" Use of these criteria will help select inquiries with the largest potential health impact.

Using health targets as the main criteria on the checklist proved to be very useful, as these goals are based on the main determinants of health. The most frequently used targets in the screening process were participation in and influence on society, economic and social security, and healthy working life. These three goals are very broad and consist of several sub-targets and therefore are often affected by policy proposals. Moreover by including such health targets in a screening tool their use can be evaluated. This use of targets in a HIA can provide information about if and how the targets are regarded in policy proposals, and in which Ministries.

The screening process was not considered to be difficult, but tricky. A necessary requirement for the screening process was the formation of a HIA core group. This consisted of a number of experts from the NIPH with different backgrounds. The core group screened some of the inquiries, making it possible to discuss general aspects of the process and suggest improvements. It was important to reach consensus when there were doubts as to whether certain inquiries necessitated HIA. A core group such as this appears to essential for a successful HIA process.

Conclusion

HIA is not a discipline or a subject of in its own right, but more of a systematic process for predicting changes in population health status as a result of a specific policy proposal. The aim is to place health on the political agenda of all governmental departments and provide policy-makers with better information. The development of a more regular and systematic HIA has just begun in Sweden and elsewhere, and it is important to continue analysing this process. The next step as mentioned earlier is to set the conditions on how to prioritise among inquiries that led to a HIA, and with this knowledge, move on to the scoping and appraisal stage. In 2003 the NIPH will present the study to the Ministry of Health in Sweden, and working together to set the direction for the future work of HIA in Sweden.

"Approximately one third of all governmental investigations ought to include a HIA"

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Using risk analysis in Health Impact Assessment: the impact of different relative risks for men and women in different socio-economic groups

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Abstract

The aim of this study is to contribute to the emerging field of quantification of Health Impact Assessment (HIA), by analysing how different relative risks affect the burden of disease for various socio-economic groups (SES). Risk analysis, utilising attributable and impact fraction, raises several methodological considerations. The present study illustrates this by measuring the impact of changed distribution levels of smoking on lung cancer, ischemic heart disease (IHD), chronic obstructive lung disorder (COLD) and stroke for the highest and lowest socio-economic groups measured in disability adjusted life years (DALY). The material is based on relative risks obtained from various international studies, smoking prevalence (SP) data and the number of DALY based on data available for Sweden. The results show that if smoking would have been eliminated (attributable fraction, AF), the inequality between the highest and lowest socio-economic groups may decrease by 75% or increase by 21% depending on the size of the relative risk. Assuming the same smoking prevalence for the lowest socio-economic group as for the highest (impact fraction), then the inequality may decrease by 7–26%. Consequently, the size of the relative risk used may have a significant impact, leading to substantial biases and therefore should be taken into serious consideration in HIA.

Keywords: Health Impact Assessment; Risk analysis; Inequality; Relative risks; Attributable and impact fraction; Disability adjusted life years (DALY)

1. Introduction

An increasing number of policy documents from national and international agencies emphasise reduced inequity in health as an overriding goal. More often they set up targets in terms of determinants of health thereby emphasising the multi-sectorial responsibility for public health development. Many organisations

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have highlighted the importance of looking at the effects of different policies on the health outcome [1–8]. Therefore, it is important that policies and programmes in a wide range of sectors are subjected to assessments of their impact on health and health inequality, so called the Health Impact Assessments (HIA) [9]. The present study applies especially to the quantification of HIA, analysing how the use of different relative risks affect the outcome in disability adjusted life years (DALYs) for men and women in different socio-economic groups (SES).Several countries have put HIA on their political agenda both at the national and local level [10–16]. In Sweden, the government has recently presented its Public Health Bill, containing 11 national, equity-oriented public health targets [17]. The government has acknowledged HIA as a potential method for analysing the future health status of the population with an equity perspective [18]. The added advantage of a HIA with an equity focus is that it analyses the effects of different policies on health in different subgroups of population. It has been shown that disadvantaged groups suffer a greater share of the burden of disease and also that the gap between the disadvantaged and the advantaged groups is persisting or widening [19–25]. It is therefore important to study the distribution of health consequences in the population of any planned policy.

The development of HIA is still in its initial stage. Many studies have focused on the implementation processes of HIA, and on guidelines and reviews [26–33]. Since it is still in its initial phase, there is a lack of both information and data that is required to carry out a HIA. The lack of evidence makes it difficult to decide whether or not the calculations in the HIA are valid, but it is also very important that studies are carried out showing the results of using different kinds of evidence [34,35].

The aim of the present study is to analyse how different relative risks, incidence rates for smokers compared to non-smokers for men and women in the highest and lowest socio-economic groups, affect the burden of disease. To illustrate the HIA-quantification, an example of the burden of disease impact of changes in smoking prevalence (SP) is presented in relation to lung cancer, ischemic heart disease (IHD), chronic obstructive lung disorder (COLD) and stroke. The study tries to address the following question: If tobacco smoking could be eliminated (attributable fraction, AF), or if the prevalence of smoking in the lowest socio-economic group could be reduced to the level of the highest socio-economic group (impact fraction), how much would the burden of disease and the inequality in the burden be reduced by depending on the relative risks?

2. Material and method

Since many countries are already in the process of developing public health targets, it is inevitable to use quantitative measures. There are several ways of using quantitative measures for predicting health outcomes, e.g. the PREVENT model [36], or the one we use in this study, the attributable and impact fraction. An optimal model would in best cases cover:

(a) effects on mortality and morbidity;
(b) effects of lag times;
(c) effects of previous exposure secular trends;
(d) interactions between exposures and co-morbidity;
(e) high level of simplicity and transparency.

It is difficult to use a model that covers it all, e.g. the PREVENT model covers (b) and (c) whereas attributable and impact fraction covers (a) and (e).

However, the quantification, i.e. the use of attributable and impact fraction, raises several methodological concerns. This study focuses on the use of different relative risks, for different socio-economic groups obtained from different published studies conducted in various social contexts. It may be assumed that the relative risk for a disease following an exposure is not the same for all populations or for subgroups within that population (e.g. men and women, socio-economic groups, ethnic groups, age groups). It is therefore important to look at the distribution within the population and also to analyse how the use of different relative risks affects the outcome measured in DALYs.

This study uses the method of attributable and impact fraction to estimate the effect of a determinant [37]. To do that, we need information about the changes of exposure level achieved by intervention, the relative risks for a disease following an exposure and a measure of health. As one policy change might influence several determinants and one determinant might influence the risk of several diseases or injuries

there is a need for a common 'currency' for different health outcomes, such as DALY. The number of DALYs shows the burden of disease for a population, considering both the mortality and the morbidity rates for a disease in the population [38]. Based on this information, a number of DALYs attributed to the changing exposures can be calculated.

It is possible to estimate and quantify HIA both prospectively (avoidable burden of disease) and retrospectively (attributable burden of disease) [39]. The prospective HIA might be most relevant for health planning since it estimates the expected future health effects of a certain policy/intervention. However, calculations of effects of today's changes in exposure on future burden of disease should ideally be based on knowledge on how today's burden of disease will change during the latency period due to other changing exposures and secular trends in mortality and morbidity. However, also the retrospective HIA may be very useful. It shows how different policies and their effects on exposure in the past may have influenced the current burden of disease. This gives valuable information for the future and might verify the estimations done in the past. The present empirical analysis in this paper is done as a retrospective analysis.

There is also a choice of using the attributable or impact fraction. The attributable fraction shows how many DALYs that will be decreased by if the exposure level is eliminated, i.e. calculated as zero (the so-called theoretical distribution risk). A more reasonable distribution risk is the feasible or possible distribution (impact fraction), putting the exposure level to a more realistic level, not to zero. Impact fraction shows, therefore, how many DALYs that will be decreased if the exposure level is decreased to a lower level.

The relative risks of the diseases associated with smoking were assessed through a literature search on Medline. The database searches on disease incidence rates according to smoking habits and socio-economic group resulted in the retrieval of about 250 abstracts. The keywords used were "lung cancer (ischemic heart disease, chronic obstructive lung disorder, stroke), socio-economic status (group, social class) and smoking (tobacco)". Unfortunately, most of these studies were showing their results already adjusted for either smoking/non-smoking or socio-economic groups. Since the present study aims at showing relative risks for smokers versus non-smokers for socio-economic group separately, it was not possible to use the already adjusted rates. However, two studies were found on lung cancer [40,41], one on coronary heart disease [41], two on ischemic heart disease [42,43], three on chronic obstructive lung disorder [44–46] and none on stroke. The definitions of smokers and non-smokers and the measures of smoking exposure vary in the different studies. The definitions of socio-economic groups also differ, sometimes measured as manual and non-manual workers, blue- and white-collar workers or by socio-economic status (Table 1).

The smoking prevalence levels were obtained from the Swedish Annual Survey of Living Conditions (ULF) [47]. These surveys are carried out annually by Statistics Sweden since 1975 and are based on nation-wide representative samples of the Swedish population, 16–84 years old. The survey covers questions on, e.g. self-reported illness living conditions, and life style, such as smoking habits. The time lag between exposure and the diseases studied needs to be taken into consideration. For lung cancer, the smoking prevalence rate of 1977 is used and for ischemic heart disease, chronic obstructive lung disorder and stroke, the prevalence of 1987 is used, assuming a shorter latency period. Table 2 shows the smoking prevalence rates for the highest and the lowest socio-economic group.

The number of DALYs per 10,000 (individuals) caused by a certain disease is based on the calculations of the Swedish burden of disease study [48]. It is based on mortality data during 1988–1995 for each socio-economic group. Morbidity data on lung cancer was based on the National Cancer Registry, on IHD and stroke on national in-patient data. Distribution across SES was set equal to what was found for morbidity. Prevalence of chronic obstructive lung disease was based on national surveys and distribution across SES. The Swedish report is presented elsewhere [48,49]. The number of DALYs is recalculated into the highest and lowest socio-economic groups by the slope index of inequality showing the absolute difference in DALYs between the manual and non-manual workers [50]. It corresponds to the slope of the regression of DALYs per 10,000 across ranked socio-economic groups. From these, the socio-economic gradient in the burden of disease is calculated.

Table 1
The variables in the articles on lung cancer, ischemic heart disease (IHD) and chronic obstructive lung disorder (COLD)

	Lung cancer		IHD			COLD	
	Hein et al. [40]	Marmot et al. [41]	Hein et al. [42]	Marmot et al. [41]	Pocock et al. [43]	Rimington [44]	Lebowitz [46]
Type of study	Cohort	Cohort	Cohort	Cohort	Cohort	Cross-sectional	Cross-sectional
Location	Copenhagen	London	Copenhagen	London	UK	Cheshire	Tuscon
Year	1970–1971	1967–1969	1970–1971	1967–1969	1978–1980	1964–1965	1970–1971
Years of follow-up	17	10	17	10	6		
Age (years)	40–59	40–64	40–59	40–64	40–59	15 to >60	
Cases	144	194	585	704	336		
Controls/cohort size	5249	17530	5249	17530	7735		3800
Measuring							
Mortality	×	×	×	×	×		
Morbidity	×		×			×	×
Definition							
Highest SES	Upper class	Professional	Upper class	Administrators	Manual	Social class 1	>16 years of education
Lowest SES	Lower class	Other[a]	Lower class	Other[a]	Non-manual	Social class 4	<8 years of education
Definition							
Smokers	All smokers	Current smokers	All smokers	Current smokers	Current smokers	Cigarette smokers	Present smokers
Non-smokers	Never smokers	Non-smokers	Never smokers	Non-smokers	Never smokers	Non-smokers	Never smokers
Adjustments		Age		Age	Age	Age	Age, sex

[a] Other groups than administrators, professional and clerical.

Table 2
Smoking prevalence (%) in Sweden, for men in the highest and lowest socio-economic groups

Year	Lowest SES	Highest SES
1977	48	35
1987	35	26

The attributable fraction was calculated to estimate the burden of disease of today, from changes of exposures in the past [51]. The attributable fraction explains how many DALYs that would have been reduced if the smoking prevalence would have been put equal to zero, that is how the burden of disease is reduced if no one smokes. The attributable fraction describes the difference in the burden of disease between smokers and non-smokers and it is calculated in the present study for both the highest and lowest socio-economic groups. The formula was used as follows:

$$\mathrm{AF} = \frac{\mathrm{SP}(\mathrm{RR}-1)}{(\mathrm{SP}(\mathrm{RR}-1)+1)\mathrm{DALY}}$$

SP: smoking prevalence in the population; RR: relative risk; DALY: number of DALY.

The impact fraction indicates the reduction in the number of DALYs when the smoking prevalence is decreased (from SP1 to SP2) [52]. The impact fraction describes the reduction in the burden of disease with a reduced smoking prevalence, assuming in this study that the smoking prevalence for the lowest socio-economic group would be reduced to the prevalence level of the highest socio-economic group. The following formula was used:

$$\mathrm{IF} = \frac{(\mathrm{SP2}-\mathrm{SP1})+\mathrm{RR}(\mathrm{SP1}-\mathrm{SP2})}{((1-\mathrm{SP1})+\mathrm{RR}(\mathrm{SP1}))\mathrm{DALY}}$$

SP1: smoking prevalence before prevalence change; SP2: smoking prevalence after prevalence change; RR: relative risk; DALY: number of DALY.

3. Results

Table 3 shows how the relative risks and risk differences for smoking and subsequent disease vary in the different studies. It illustrates that the relative risks differ greatly between different studies and also between the highest and lowest socio-economic groups,

Table 3
The relative risks (RR) and risk differences (RD) among smokers vs. non-smokers of lung cancer, ischemic heart disease (IHD) and chronic obstructive lung disorder according to the highest and lowest socio-economic groups (SES)

	RR		RD	
	Highest SES	Lowest SES	Highest SES	Lowest SES
Lung cancer				
Hein et al. [40]	6.7	4.7	1.7	4.8
Marmot et al. [41]	5.4	13.6	1.06	3.15
IHD				
Hein et al. [42]	1.9	1.5	3.5	8.5
Marmot et al. [41]	3.1	1.2	3	1.5
Pocock et al. [43]	3.2	3	3.35	3.5
COLD				
Rimington men [44]	2.6	3.3	9	12.4
Rimington women [44]	5.5	3.2	8.2	9.7
Lebowitz [46]	1.6	1.1	0.3	0.8
Higgins et al. [45]	5.5	5.9	22.2	26.2

but the risk differences are in most cases higher for the lowest socio-economic group. This indicates a higher susceptibility to the effects of smoking among lower socio-economic groups, i.e. that other contributing causes linked to SES interact with smoking [53].

The relative risks, smoking prevalence and number of DALYs for each disease are put in the calculations of attributable and impact fraction. In Table 4, the reduction in the number of DALYs is shown. For lung cancer, depending on the size of the relative risk, the reduction would be between 63–85 DALYs per 10,000 in the lowest socio-economic group and between 32–35 DALYs per 10,000 if none would have smoked in 1977 in the highest socio-economic group. Attributable fractions are used in the same way for ischemic heart disease, chronic obstructive lung disorder and stroke (using the smoking prevalence of 1987). In the same way, it also illustrates the reduction in the number of DALYs per 10,000 when the smoking prevalence for the lowest socio-economic group would be the same as for highest group, e.g. for lung cancer, the number of DALYs per 10,000 would be reduced by 17–23 DALYs per 10,000.

Combining the total number of DALYs from the beginning and the reduced DALYs from calculations of attributable and impact fraction for the lowest and the highest group separately, it is possible to see the

Table 4
Reductions in DALYs per 10,000 after reducing the smoking prevalence to zero (attributable fraction), or to the same level as for the highest socio-group as for the lowest (impact fraction), given the relative risk (RR) and the number of DALYs for lung cancer, ischemic heart disease (IHD), chronic obstructive lung disorder (COLD) and stroke for the lowest and highest socio-economic groups

	RR (range)	DALYs per 10,000	Attributable fraction (reduction in DALYs per 10,000)	Impact fraction (reduction in DALYs per 10,000)
Lung cancer				
Lowest SES	4.7–13.6	99	63–85	17–23
Highest SES	5.4–6.7	53	32–35	
IHD				
Lowest SES	1.2–3.0	652	43–268	11–69
Highest SES	1.9–3.2	333	63–121	
COLD				
Lowest SES	1.1–5.9	86	3–54	1–14
Highest SES	1.6–5.5	46	6–25	
Stroke				
Lowest SES	1.2–3.0	178	12–73	3–19
Highest SES	1.9–3.2	105	20–38	

total potential reduction in DALYs (Table 5). The total sum, before the reductions in smoking prevalence, is 537 DALYs per 10,000 for men in the highest socio-economic group. If no one would smoke (AF) there would be a reduction of 121–219 DALYs per 10,000. For the lowest socio-economic group, the number of DALYs is 1015 DALYs per 10,000 that would be reduced by 121–480 DALYs per 10,000 if none would smoke. If the smoking prevalence for the lowest group would be reduced to the same level as the highest socio-economic group, a reduction of 32–125 DALYs per 10,000 would be possible.

Also, the differentials between the lowest and the highest socio-economic group are shown. When the

Table 5
Total number of DALYs per 10,000 with current levels of smoking with zero prevalence of smoking (AF), and with the same smoking prevalence in the lowest as in the highest socio-economic group (IF) for lung cancer, ischemic heart disease (IHD), chronic obstructive lung disorder (COLD) and stroke for the highest and lowest socio-economic groups

	DALYs per 10,000 before smoking reductions	Reduced DALYs per 10,000 after put smoking prevalence to zero (AF)	Reduced DALYs per 10,000 after put smoking prevalence to the same amount as high SES (IF)
Lowest SES			
Lung cancer	99	63–85	17–23
IHD	652	43–268	11–69
COLD	86	3–54	1–14
Stroke	178	3–54	3–19
Sum	1015	121–480	32–125
Highest SES			
Lung cancer	53	32–35	0
IHD	333	63–121	0
COLD	46	45–809	0
Stroke	105	20–38	0
Sum	537	121–219	0
Difference between the lowest and highest SES	478	119–576	353–446

attributable fraction is estimated, the differential between the socio-economic groups changes from 478 DALYs per 10,000 to 119–576 DALYs per 10,000. This means that the inequality could be reduced by 75% or be increased by 21%. If the smoking prevalence for the lowest socio-economic group is decreased to the level of the highest group, the differential changes to 353–446 DALYs per 10,000 (353 indicates the differences between the number from the beginning, 476, and the highest number of reduction, 125, and the conversely for 446).

4. Discussion

The results illustrate that if both the highest and lowest socio-economic groups would stop smoking, the difference between the groups may be decreased by 75% (using the highest relative risks for both groups) or may be increased by 21% (using the lowest relative risks for both groups). If the smoking prevalence would be the same for the lowest socio-economic group as for the highest, then the inequality would be decreased by 17–34%, also depending on the size of the relative risks. Moreover, the results reveal that the differentials in the burden of disease not necessarily are decreasing because the burden of disease is reduced. Consequently, the smoking would be eliminated the inequality could go both ways, either be reduced or increase. If the lowest socio-economic group would decrease its smoking rate to the one of the highest group, then the inequality would decrease. However, these calculations are made with the assumption that the relative risks stay the same. This is very unlikely, because if the prevalence rate is decreasing, the risk will be decreasing as well.

The results show that the relative risks differ depending on the context in which the study is conducted. It shows that the results are very sensitive to what relative risk one chooses to use. The results also show that the relative risks vary in different socio-economic groups, and that it also is affects the size of the inequality between the groups (depending on the size of the relative risk used).

This study uses a few scientific studies as a base for its results, rather than a meta-analysis. This is done because we wanted to show how the results vary from different relative risks, instead of using only one. A meta-analysis would most probably not be an easy task since a study like this may introduce different kinds of biases. First, there may be bias within the studies used. Comparing the relative risks in the studies with each other, also introduce bias since the studies differ in their definitions of smoking status and socio-economic status (Table 1). The studies used different descriptions of how to define a never smoker or a non-smoker as well as a daily smoker, the intensity of the exposure, what type of tobacco and how much or for how long time an individual had smoked. The definitions of socio-economic status varied from using blue and white-collar workers, grade of socio-economic status (four- or five-scale grade) or manual or non-manual workers. This lead to the assumption of just looking at the extreme groups, the lowest and highest socio-economic groups, but nevertheless, this assumption leads to bias in the present study.

Second, the relative risks are taken from different studies where the level of exposure to other (interacting) causes in the pathway might be different from the ones in the Swedish context. This may introduce bias in the results. Table 4 shows the relative risks and the risk differences from the studies. It can be seen that the relative risks are sometimes higher for higher socio-economic groups (caused by a low risk for the unexposed), but the risk differences are usually lower for the same groups as they might be less exposed to interacting causes.

Furthermore, the relative risks differ between socio-economic groups, but the study was, however, not able to show risks for women. Since there was only one study [44] that showed the relative risks for women, it was not possible to calculate the total smoke-related burden of disease for women. However, other studies have shown that women have higher relative risks, but lower risk differences than men, also for women in different socio-economic groups [54,55]. This strongly implies that a HIA should be carried out separately for men and women whenever possible.

Moreover, there was only prevalence data found for chronic obstructive lung disorder in the relative risk estimates. This may bias the results since the prevalence rates include the duration of disease.

A similar problem arises when we calculate attributable fractions of DALYs. The theory behind

calculating AF is based on incidence. DALYs, however, are not only based on incidence data—they also include duration and disability weighting. We therefore assume that the exposure does not affect neither duration or disability weight. This is probably not true and we might therefore underestimate the attributable burden.

There were no studies that reported relative risks of smoking stratified for men and women in different socio-economic groups. The same relative risks for men and women were used as for ischemic heart disease that may bias the result.

Despite all these shortcomings, we still consider it highly relevant to undertake quantitative risk analysis in HIA. The advantage of quantifying the HIA is that one gets knowledge if there are going to be any impacts, and that it also allows prediction of any impact of a given policy. Furthermore, it allows the estimation of the magnitude of that impact as well. Also, several countries are in the process of developing their own national public health targets, and from that point of view quantitative measures are desirable. The targets often include equity dimensions, i.e. that the gaps between different groups within the population should be decreased. Having HIA carried out with an equity perspective would therefore be important, however, up to date, not always feasible.

5. Conclusions

The results of the study show that the inequality could both decrease and increase when the smoking prevalence rates were put to zero between the lowest and highest socio-economic groups. If the prevalence rate for the lowest socio-economic group would be the same as for the highest group, then the inequality would decrease. These calculations are based on the assumption that the risk is not changing even when prevalence rate changes.

In spite of the shortcomings discussed above, it is very important to make quantitative estimations in HIA. Several organisations and countries have emphasised health as one of the key issues for economic growth and well being. Moreover, several countries have recently defined national public health targets. HIA proved to be a useful tool for assessment of health impacts of planned policies and for evaluating interventions aimed at improving public health. However, the development of HIA, especially quantitative HIA is just in its early stage and still is a challenge for the research community.

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Window of opportunity for intersectoral health policy in Sweden—open, half-open or half-shut?

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SUMMARY

'Health in All Policies' (HiAP) is defined as a 'horizontal, complementary policy-related strategy with a high potential for contributing to population health'. To ensure that health impacts are highlighted across sectors, the support of actors in different sectors, not just the health sector, is needed. Public health, here defined as a universally important but a low prioritized politics area, needs to involve high politics areas to fulfil the HiAP strategy. This study aimed to analyse the agenda setting, formulation, initiation and implementation of the intersectoral public health policy and one tool of HiAP, health impact assessment (HIA), at the national and local level (exemplified by Stockholm County) in Sweden. A literature search was carried out of scientific and grey literature on intersectoral health policy and HIA in Sweden. The study was a policy analysis, using a content analysis method, and the theoretical framework of Kingdon where the results were examined through problem identification (why a window of opportunity opens for an intersectoral health policy and HIA), the factors and impact of politics (support for the formulation and implementation of policy) and policy (how best to solve the problem). The results showed that actors perceived the problems (the rationale) differently depending on their agenda and interest. Politicians and experts had a high impact on the formulation of the policy, agreeing on the policy goals. However, there was little focus on implementation plans implying that the political actors were not in agreement, and the experts sometimes showing conflicting evidence-based opinions on how to best ensure the policy. Without this in place, it is difficult to involve high politics areas, and vice versa, without the involvement of high politics, it is difficult to achieve the policy. However, this is a long-term process, where small steps need to be taken, leaving the policy window half-shut.

Key words: health politics; health impact assessment; policy and implementation analysis

INTRODUCTION

Health in All Policies (HiAP) is a '*horizontal, complementary policy-related strategy with a high potential for contributing to population health*' (Ståhl *et al.*, 2006). HiAP is a developing concept and a continuation of intersectoral action for health promoted in WHO's HFA-policy (WHO, 1985, 1999) and in the EU Commission's treaties and strategies (European Commission, 1997, 2000). It has also been supported by the UN under sustainable development. Health impact assessment (HIA) has been mentioned as a promising tool to realize HiAP and to ensure that health is not overlooked in other policy areas. HIA is a prospective tool that predicts the health consequences of policy-making. It aims to increase the awareness of health effects outside the health sector, especially to inform decision-makers (Kemm *et al.*, 2004). There are many national and local initiatives on HiAP and HIA (Kemm *et al.*, 2004; Ståhl *et al.*, 2006). However,

there is some scepticism regarding the use and effectiveness of HiAP and HIA which requires collaboration and co-operation between actors in different policy sectors and political support for 'joint-up' policies. HIA differs significantly between countries in regard to administrative and political structure, human and financial resources, and political will, support and commitment (Ståhl *et al.*, 2006). The problem seems to be that public health is not prioritized high enough on the political agenda. In this study, we use and define the concept of 'high politics' as politically prioritized issues, which is identified as among the main concerns for all areas across sectors, and are in the focus of policy coordination and budgeting by actors such as the Prime Minister or the Minister of Treasury. In contrast, 'low politics' are issues given relatively low political weight in the overall coordination of politics. Although health appears to be a universally important area for the public (Kingdon, 1995), public health as an issue extending over the health care sector rarely appears among the issues of high politics.

How can a window of opportunity be opened for an intersectoral public health policy in spite of the seemingly low political priority given to the issue? The aim of this study was to analyse the national intersectoral public health policy and one tool of HiAP, HIA, at the national and local level (exemplified by Stockholm County) in Sweden by answering the following questions:

(1) What were the underlying problems (the rationale) that led to an approval of a white paper on a national intersectoral public health policy (a policy window)?
(2) How did the involved actors, the politicians and administrative/technical/experts differ in regard to the initiation, formulation and implementation of the intersectoral policy and its tool HIA?
(3) Were there differences in the initiation, formulation and implementation between the national and the local level?

THEORETICAL FRAMEWORK

There are rather few studies on the politics of health policy even though there is currently a growing body of evidence in this area (Signal, 1998; McGinnis *et al.*, 2002; Baggot, 2000; Bambra *et al.*, 2005; Mannheimer *et al.*, 2006; Oliver, 2006). Navarro, *et al.*, (Navarro and Shi, 2001; Navarro *et al.*, 2006) found that political ideologies of governing parties affect some indicators of population health and that political parties with egalitarian ideologies appear to implement redistributive policies. Signal (Signal, 1998) states that politics and ideologies are underpinning all health promotion issues and should be more explicit. Bambra, *et al.* (Bambra *et al.*, 2005) promote 'health politics' since health determinants are amendable to political interventions.

This study used the conceptual model of Buse *et al.* (2005) to guide the analysis of the core content of relevant documents and background papers on the Swedish HIAP/HIA policy. This model focuses on the content, actors, processes and context of policy-making as well as on the phases of agenda setting, policy initiation, policy formulation and implementation. The core content is then re-analysed and re-interpreted on the basis of Kingdon's (1995) theory. This framework helps to emphasize the political dimension in HiAP and HIA (Mannheimer *et al.*, 2006). According to Kingdon (1995), policy changes occur in three 'streams': at the levels of problem identification, making policy choices and in political action and climate. The three streams operate in a constant 'flow' with no clear beginnings or ends. For a change in policy to occur (policy window), a window of opportunity should occur in all three streams simultaneously. The strength of Kingdon's framework is that a policy is analysed in relation to the underlying problems, that is, why a policy appears at a particular moment and how. This relates to the politics element which stresses the activities of different political actors and takes into account the political and ideological views. The policy stream focuses on the technical and administrative elements of problem solving by different actors.

METHODS

The data consisted of scientific articles and grey literature, including a number of policy documents and background papers. A search on Pubmed on the topic 'HIA in Sweden' resulted in a retrieval of 3 out of 148 hits (Nilunger *et al.*, 2004; Finer *et al.*, 2005; Forsberg, 2005). 'Intersectoral health policy and Sweden' resulted in one hit (Eklundh and Pettersson, 1987) which led us to other articles in relation to the new

public health policy (Hogstedt *et al.*, 2004). The grey literature includes the governmental website (www.regeringen.se) where data were found on development of the white paper Public Health Goals (Ministry of Health, 1999, 2000, 2002) and Strategic challenges for sustainable development (Ministry of Sustainable Development, 2005). Because the Ministry of Health assigned the Swedish National Institute of Public Health (NIPH) to monitor the development of the public health policy, a search at NIPH resulted in one report on public health politics (Swedish National Institute of Public Health, 2005a), another concerning the development of indicators to realize the public health policy (Swedish National Institute of Public Health, 2005b) and five reports on the HIA development (Swedish National Institute of Public Health, 2001, 2004, 2003, 2005c, 2005d). There was also one case-study report on the public health policy development conducted for the WHO EURO (Östlin and Diderichsen, 2001) and a conference report on HIA (Nordic School of Public Health, 2000).

At the local level, we found one scientific article via Pubmed (Finer *et al.*, 2005). Most of the HIA documents were found at the Swedish Federation of Local Authorities and Regions (www.skl.se). Moreover, the Public Health Guide (www.folkhalsoguiden.se) provided data on the public health policy in Stockholm. Personal contacts were made with staff at the Stockholm County to receive more information on the current situation regarding HIA and the public health policy.

The analysis was made in two stages. The first stage was a descriptive analysis to extract the core content of data on aspects that Buse *et al.* (2005) find as essential in retrospective and descriptive policy analysis. First, all the data were read through carefully. We then highlighted and extracted the content that was related to the HIAP/HIA policy, the actors named with regard to this policy, the policy and political processes and contextual factors. Finally, the highlighted sections of the data were categorized and organized from the perspectives of agenda setting, and policy initiation, formulation and implementation. The analysis followed the methodology of theory driven qualitative content analysis focusing on factual statements expressed in the data (Silverman, 2000; Alasuutari, 1993).

The second stage applied the theoretical model of analysing the opportunities for policy change by Kingdon (1995). The results of the first stage of the analysis were recategorized and reinterpreted to fit Kingdon's stream model and to enable making conclusions about the data on the basis of this theoretical framework. A good example of carrying out this part of the analysis was an earlier study on US Health Care Reforms by Rushefsky and Patel (1998).

RESULTS

Table 1 provides a summary background of the public health policy and HIA development at the national and local (Stockholm) level in Sweden as well as country facts such as population and area size etc. (Statistics Sweden, January 2007).

Agenda setting

The rationale for creating a public health policy varied depending on different actors' perspectives. From the politicians' angle, the main concern was the absence of a comprehensive national public health policy including national targets and strategies in Sweden (Ministry of Health and Social Affairs, 2000; 2002). The rationale was to create a *'pro-active, multisectoral public health approach . . . at all levels'* (Ministry of Health and Social Affairs, 2000, 2002). It was also stated that sectors outside the health sector had an impact on health development. However, co-ordination and collaboration between different sectors were absent (Ministry of Health and Social Affairs, 2000, 2002). It was seen desirable to involve all relevant sectors and actors at different levels, such as experts, the civil society, trade unions and the general public, in the development of the public health policy (Ministry of Health and Social Affairs, 2000, 2002).

From the angle of the public health experts, the new statistics showing stagnating or even increasing health inequalities between different population groups in Sweden, despite steadily increasing life expectancy, was raised as a major problem (Ministry of Health and Social Affairs, 2000, 2002, National Board of Health and Welfare 1994, 1997, 2001). It was also argued that the harder social and economic climate in the country would make the financial and health situation worse for some groups such as for young parents and particularly single mothers (Ministry of Health and Social Affairs, 2000, 2002). Studies indicated that more and more people had to face constraints in terms of their financial situation,

Table 1: Background information of contextual factors and the creation of the intersectoral policies and HIA at the national and local level in Sweden

	National level	Local level
Location	Sweden	Stockholm
Population	9 117 712	1 918 104
Size	449 964	6 519
Policy	Health on equal terms—national goals for public health	Public Health Policy Stockholm County Council
Targets	11 broad goal areas based on the determinants of health, non-specific in time or reduction of risk factors	5 targets specific for Stockholm country, a broad perspective based on determinants of health
Year	Developed in 1995–2002; published in 2002; adoped by government in 2003	Published and adopted by the government in 2005
Initiated by	The government (The Social Democratic Party)	The local government followed the national policy (The Social Democratic Party)
Actors	The national public health committee: members of the Swedish parliament, experts and advisors from public and local authorities, and organizations,	Local committee: members of the Stockholm County Assembly and civil servants
HIA	From 2000	From 1994
Main actors	The Ministry of Health, The Ministry of Sustainability, The National Institute of Public Health	The local government, the Federation of Country councils and Local Authorities, Stockholm counties
Status	HIA was mentioned in the policy as a potential tool to ensure intersectoral policy. The national institute of Public health was assigned to develop HIA further, especially HIA methods	HIA was not mentioned in the policy. Strong focus and development of HIA from the mid 90's by both politicians and civil servants. Currently, little attention around HIA

which was in turn associated with increased long-term sickness rates, and there were indications of increasing mental ill-health among children and young adults (Ministry of Health and Social Affairs, 2000, 2002).

The rationale for using HIA was to raise awareness and put public health higher on the political agenda and to systematically analyse health impacts of political proposals (National Institute of Public Health, www.fhi.se). This was also highlighted in another policy proposal in Sweden for sustainable development where analysis of social, economic and environmental impacts on development (including health) was emphasized (Ministry of Sustainable development, 2005). The development of HIA was also promoted internationally, for example by the WHO Health 21 policy, the Amsterdam treaty of the EU Commission (Nordic School of Public Health, 1999; Sweden National Institute of Public Health, 2001), the Lisbon strategy of the EU Commission, the UN Johannesburg policy and the Ottawa Charter (Sweden National Institute of Public Health, 2005d). These policies and strategies are emphasizing the need for HIA and analysis of health and social impacts in regard to sustainable development.

At the local level, in Stockholm, the rationale for using HIA and the creation of an intersectoral public health policy was identified in a similar way. However, the development and testing of HIA started a decade before an intersectoral overall public health policy was adopted in Stockholm. The relatively early development of HIA took place because 'human health was highly valued' and there was a need for a systematic approach to analysing health impacts (The Federation of County Councils and Local Authorities, 1998). The intersectoral policy in Stockholm, created in 2005 and focusing on the local priorities and problems (five targets), was adapted on the basis of the national public health policy.

Policy initiation and formulation

At the time of the development of the national public health policy, Sweden was governed by the social democratic party with support from the left-wing party and the environmental party. To develop the public health policy, a parliamentary commission was set up. It consisted of politicians representing all seven political parties, including the opposition parties, and a number of experts from academia, trade unions,

authorities and civil society organizations (Ministry of Health and Social Affairs, 2000, 2002). Although the consensus behind the policy and its focus on 'health on equal terms' were strong, some political parties made written reservations about components of the policy. The final policy proposal included four appendices with reservation made by three political parties. The conservative party made reservations against the overall formulation of the policy. The liberal party and advisors from the Swedish Association of Local Authorities objected to the idea of a public health law, which would require municipalities and county councils to draw up health plans. The left-wing party objected to the fact that the proposal failed to sufficiently address the increasing inequality in health between different groups (Ministry of Health and Social Affairs, 2000, 2002). It should be noted that the seven politicians were not just general politicians, but five of them were health or environmental experts. This may not affect the final document directly, but it could have had an impact on the preparatory processes, i.e. the working papers (Ministry of Health and Social Affairs, 1999, 2000) had a much stronger and specific focus on targets related to social determinants of health than the final version. The commission formulated the aim and scope of the policy, health on equal terms, which was kept in the final version but with less emphasis and focus on such targets.

There were many different actors influencing the policy. In addition to the politicians, there were five appointed health advisors and 11 public health experts working closely on the proposal. The working reports were sent to more than 500 actors for consultation (Ministry of Health and Social Affairs, 2000; Östlin and Diderichsen, 2001). Comments were provided by more than 200 stakeholders, representing authorities, universities, municipalities, counties, trade unions and civil society organizations, such as labour and housing organizations, alcohol/drugs groups, children's organizations, the disabled and the women's movement. Many of these actors expressed their support for the policy proposal. Some wished for more visibility of their own organization in the policy and also for clearer direction regarding their responsibility in regard to the policy (Ministry of Health and Social Affairs, 2000).

HIA was mentioned in the policy as '*a potential tool to ensure intersectoral health policy*' (Ministry of Health and Social Affairs, 2000, 2002). The NIPH was assigned by the government in 2000 to develop HIA further, in specific models and methods of HIA.

At the local level, the public health policy was conducted by a parliamentary committee consisting of all the political parties, nine politicians and civil servants (Stockholm County, 2005). The local policy adapted the national policy for its local needs. As a strategy, intersectoral work was stressed, but HIA was not explicitly mentioned in the local public health policy. The Federation of County Councils together with the Federation of Local Authorities decided to develop intersectoral tools, specifically HIA, in 1994. Three different tools were developed: the health questions, the health matrix and the HIA (The Federation of County Councils, 1998). This was carried out by politicians together with civil servants and the general public and implemented in some of the counties.

Policy implementation

According to the WHO (e.g. Health21), it was recommended that a national, high-level policy group should ensure and be accountable for the implementation of the policy. To this end, a national advisory group on public health issues was established in 2003, chaired by the Minister of Public Health. The group includes several members from the local, regional and national health authorities, representatives from the educational, employment and integration sectors, the police authority as well as representatives from all the major ministries. The group has no legal basis, but it is mandated to provide advice on priorities, lead the discussion regarding the policy and co-ordinate various actors and information. No evaluation of the effectiveness of the group has yet been completed.

The MoH assigned the NIPH to be responsible for the coordination of the public health policy activities in all sectors. Since then, the NIPH has developed indicators for the municipalities to monitor the policy implementation (Swedish National Institute of Public Health, 2005b). Moreover, the NIPH has been instructed by the government to conduct a public health policy report every forth year to present the activities and priorities for the 11 public health targets/health determinants (Swedish National Institute of Public Health, 2005a). All counties have developed an overall public health plan and 9 out of

the 18 counties had developed together with other actors, mainly with municipalities, an intersectoral plan (Swedish National Institute of Public Health, 2005a). Regarding HIA, three authorities have during 2005 started to carry out their own policy appraisals. In addition, the NIPH has produced several HIA reports focusing on the methods of HIA, but also on the relationship between politics, policy and research (Swedish National Institute of Public Health, 2001, 2005c, 2005d), such as health impacts of the Common Agriculture Policy (CAP) (Swedish National Institute of Public Health, 2003).

At the local level, there has been little information regarding the implementation or progress of the policy, only guidelines on how to implement it (Stockholm county, 2006). Each unit should develop its own targets. In Stockholm County, especially in the southwest area of Stockholm, the HIA process was initiated, implemented and evaluated. It was clear that HIA was successful because of the clear political will and the successful working methods among politicians and civil servants.

The use of HIA at the local level has decreased since 2001 in counties and municipalities with the explanation that it still needs to be developed. There has not been a political decision regarding HIA at the local level in Stockholm County. However, there have been explicit political inquiries from the opposition parties in 2003 whether or not HIA should be institutionalized, having a legal basis. In Stockholm county, it is discussed whether responsibility of HIA should move from the public health department to the Office of Regional Planning and Urban Transportation with the purpose of including HIA into the sustainable development area (personal communication). However, no activities were undertaken by the local governmental party (the social democratic party) towards that direction. HIA does not seem to be an active tool anymore.

FURTHER ANALYSIS BASED ON KINGDON'S POLICY ANALYSIS FRAMEWORK

1. *The problem stream: the rationale (problem) for creating a public health policy and using the HIA tool was multifaceted leaving the policy window fully open for the problem stream.*

The problems seemed to derive from many directions: (i) lack of an intersectoral public health policy including national targets and strategies; (ii) lack of awareness of how other sectors affect the health development of the population; (iii) a lack of collaboration and coordination between the health and other sectors; and (iv) widening health gaps between different population groups. Simultaneously, international organizations such as the EU Commission (1997) and WHO (1985, 1997) pushed the agenda on intersectorality in health and health impacts of political proposals (HIA). In addition, during the 1990s, the economical climate hardened in Sweden, with for example higher unemployment rates, especially for already vulnerable groups such as single mothers. Consequently, more people were on long-term sick-leaves or received early retirement pensions. This seemed to raise the awareness also among the public regarding the correlation between population health, the labour market and social security. The lack of health equality made a strong case among social democrats for developing an equity oriented public health policy. All these problems led to a policy window, fully opened, for a policy formulation of intersectoral health policy.

2. *The politics and policy streams: the politicians and experts (and other actors) agreed on the initiation and formulation of the policy, but there were different views regarding the implementation and action plans, such as HIA, leaving the policy window half-open for the politics and policy streams.*

Compared to some other policy areas, public health is still regarded as low politics. When the national public health policy was launched, it emphasized the need for intersectoral action for implementation around which there was a relatively strong consensus between politicians, bureaucrats, experts and other groups. Thus, there seemed to be sufficient political support and scientific evidence to realize the policy. However, it has been claimed that a formulation was achieved because the targets were quite vague (Lager *et al.*, 2006). The results of this study indicate that the guidelines for translating the policy into implementation and action plans were insufficient. There were some reservations about the policy, which suggested that not only the politicians but also experts had difficulty agreeing on action plans, such as HIA. There seem to be conflicting views in the scientific literature regarding the effectiveness of HIA.

Since the policy is not accompanied with clear action plans and accountability mechanisms, there is ambiguity about the role and responsibilities of the political and administrative actors in regard to the policy and its implementation. The policy proposed a public health law, based on the national goals. However, the policy (white paper) has not turned into a public health law.

There are no effective incentives to support the HIA development in a more bottom–up manner. To date civil society linkages to ensure the effectiveness of policy implementation and accountability seem not to be in place. Consequently, it may be assumed that actors from neither high or low politics areas are not yet fully involved in the realization of the public health policy in order to achieve its aim, leaving the policy window half-opened.

3. *The local level (Stockholm) appeared to have fewer boundaries between sectors and actors than the national level, leaving the policy window open for intersectoral health policy but half-shut for HIA.*

The working methods differ from the local to the national level. At the local level, the politicians and civil servants work more closely with one another. This means that proposals for a change can be discussed more readily and quickly. The local level also appears to favour a more informal approach to working with other parties, such as the local universities and organizations. This is not surprising since the local level is smaller and relatively autonomous. It operates more 'smoothly', with less strict boundaries between sectors. Moreover, the public health policy developed at the local level consisted of five explicit targets, whereas the policy at the national level had 11 non-specific goals. The development of the local HIA tool started already in the mid-1990s with politicians, bureaucrats and experts working together to initiate, formulate and implement it. This was evaluated with good results (Finer *et al.* 2005). However, there is still no legal basis for HIA and there does not seem to be a clear answer as to why there have been difficulties in implementing HIA in the Stockholm County. There have been several political changes during the last few years which have probably affected the process. Another reason could also be that the local government awaited national support for HIA, which in fact is not in place, and the window of opportunity for HIA fades away.

CONCLUSIONS

The main findings of this study show that (i) the Swedish development correlated with the international progress and promotion of intersectoral health policy and HIA; (ii) the process of policy change was more expert-based at the national level and more politician-based at the local level; and (iii) the interest of HIA mainly took place from the mid-1990s and at least up to the approval of the national policy in 2003. In Sweden, public health is perceived as a universally important subject, but it rarely reaches the highest national policy level. However, if the HiAP strategy would be put into practice properly, having enough political support for implementation activities, it should place intersectoral health policy higher on the political agenda. To realize HiAP requires support and engagement from all relevant sectors, not just from the health sector. The formulated targets (*why*), at both national and local levels, were limited in regard to suggestions for action and plans for implementation (*how*). The policy did not manage to open the way to involve actors in other policy sectors and was not clear about their responsibility in relation to the new policy. This is a long-term process, where steps have already been taken, i.e. creation of ministerial intersectoral health working groups both at the international and national levels, leaving the policy window, all in all, half-open.

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